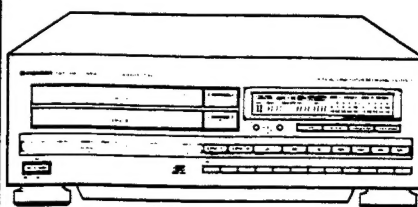


Service Manual

PIONEER
The future of sound and vision.



ORDER NO.
ARP1905

TWIN-TRAY COMPACT DISC PLAYER

PD-Z560T

PD-Z560T HAS FOLLOWING VERSIONS :

Type	Power requirement	Export destination
HEM	AC220V, 240V (switchable) *	European continent
HB	AC220V, 240V (switchable) *	United Kingdom

*Change the position of jumper of the transformer board assembly.

- This manual is applicable to the HEM and HB types.
- As to the HB type, refer to page 63.
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

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1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

VAROITUS!

LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ, SILMILLE VAARALLISTA LASERSÄTEILYÄ.

ADVERSEL:

USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGA UDSÆTTELSE FOR STRÅLING.

VARNING

DENNA APPARAT INNEHÅLLER EN LASER MED HÖGRE EFFEKT ÄN KLASS 1. TAG INTE AV HÖLJET ELLER FÖRSÖK GÖRA INGREPP I APPARATEN. ÖVERLAT SERVICE TILL KVALIFICERAD PERSONAL.



LASER
Kuva 1
Lasersäteilyn
varoituserkki

WARNING!

DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

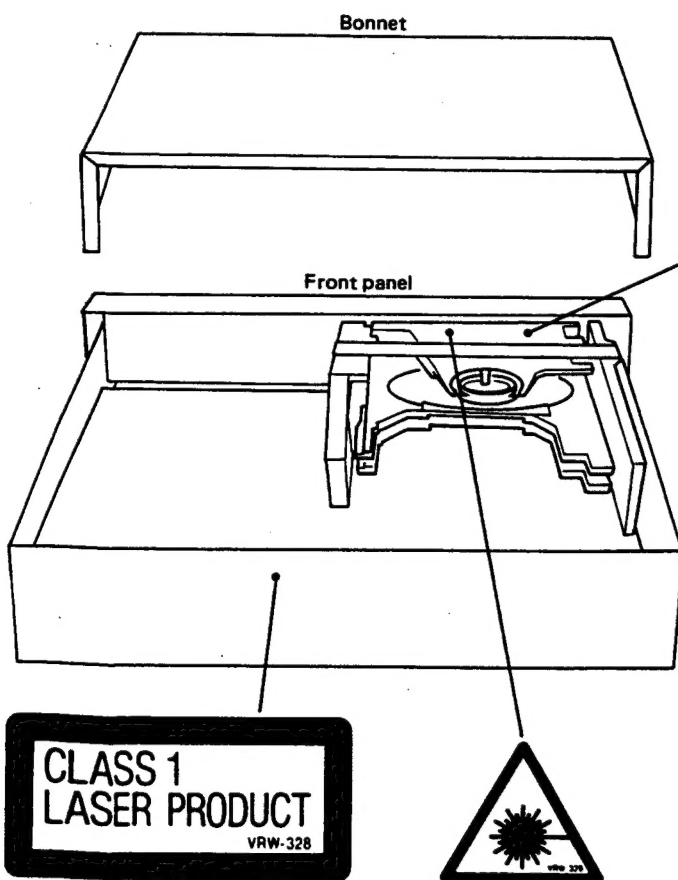


LASER
Picture 1
Warning sign for
laser radiation

IMPORTANT

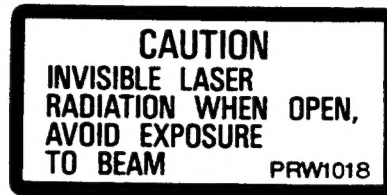
THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LABEL CHECK (TWIN type)

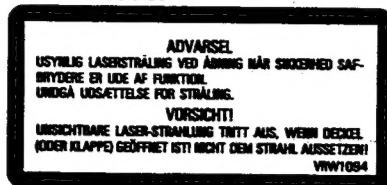


HEM and HB models

HB model



HEM model



Additional Laser Caution

1. Laser Interlock Mechanism

The ON/OFF status of the U (S601) and L (S603) switches for detecting the disc clamp state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches U and L are OFF (H).

Thus, the interlock will no longer function if switches U (S601) and L (S603) are deliberately shorted. Laser diode oscillation continues when pin 4, 5, or 29 of CXA1081S (IC1) is connected to ground or the terminals of Q1 are shorted to each other (fault condition).

2. If the fault condition described in 1 is induced with the cover open, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

NOTES :

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

2.1 Parts List of Exterior

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
$\Delta\odot$	1	PWZ1721	Main board assembly		46	PYY1091	Servo mechanism assembly
$\Delta\odot$	2	PWZ1723	Control board assembly		47	PYY1123	Bonnet
Δ	3	CM-22B	Strain relief		48	PNW1723	Clamper holder
	4	PDE1067	Connect cable		49	PEB1014	Floating rubber
Δ	5	PDG1008	AC Power cord		50		.....
Δ	6	PTT1113	Power transformer		51		.....
	7	PBA1016	Screw		52	PHC1043	Spacer
	8	PBH1068	Earth spring				(For packing in the tray 2)
	9	PBH1072	Door spring		53		.....
	10	VEC1061	Stopper		54		.....
	11	PNW1263	Insulator		55	IPZ30P120FMC	Screw
	12	PNW1376	Insulator		56	PDZ30P050FMC	Screw
	13		.....			
	14	PNM1011	Cushion rubber		101		Transformer board
	15	PNW1475	Tray				assembly
	16	PNW1476	Guide		102		Rear base
\odot	17	PNW1477	Guide base		103		Angle
	18	AAM1032	Name plate		104		GND plate
	19	PAC1427	Track button		105		Switch angle
	20	PAC1415	Disc button		106		P.C.B holder
	21	PAC1445	Power button		107		Mechanism base
	22	PAC1429	Operation button		108		P.C.B spacer
	23	PAC1430	Mode button		109		Magnet
	24	PAM1352	Display window		110		Synchronous lever
	25	PAM1337	FL plate		111		Joint plate
	26	PNW1598	Decoration plate		112		Yoke
	27	PNW1600	Door 1		113		Clamper
	28	PNW1601	Door 2		114		Power SW joint
	29	PNW1602	O/C name plate 1		115		Loading base assembly
	30	PNW1603	O/C name plate 2		116		Binder
	31	PNW1572	Indicator lens		117		Under base
	32	BBZ30P060FMC	Screw				
	33	BBZ30P080FCC	Screw				
	34	BBZ30P080FZK	Screw				
	35	BMZ20P040FZK	Screw				
	36	IBZ30P050FZK	Screw				
	37	IBZ30P120FCC	Screw				
	38	PSA40P080FZB	Screw				
	39	IPZ30P080FMC	Screw				
	40		.....			
	41	PMZ30P060FCU	Screw				
	42	PPZ30P100FMC	Screw				
	43	WB30FMC	Washer				
	44	PEA1010	Control panel unit				
	45	PYY1088	Clamper assembly				

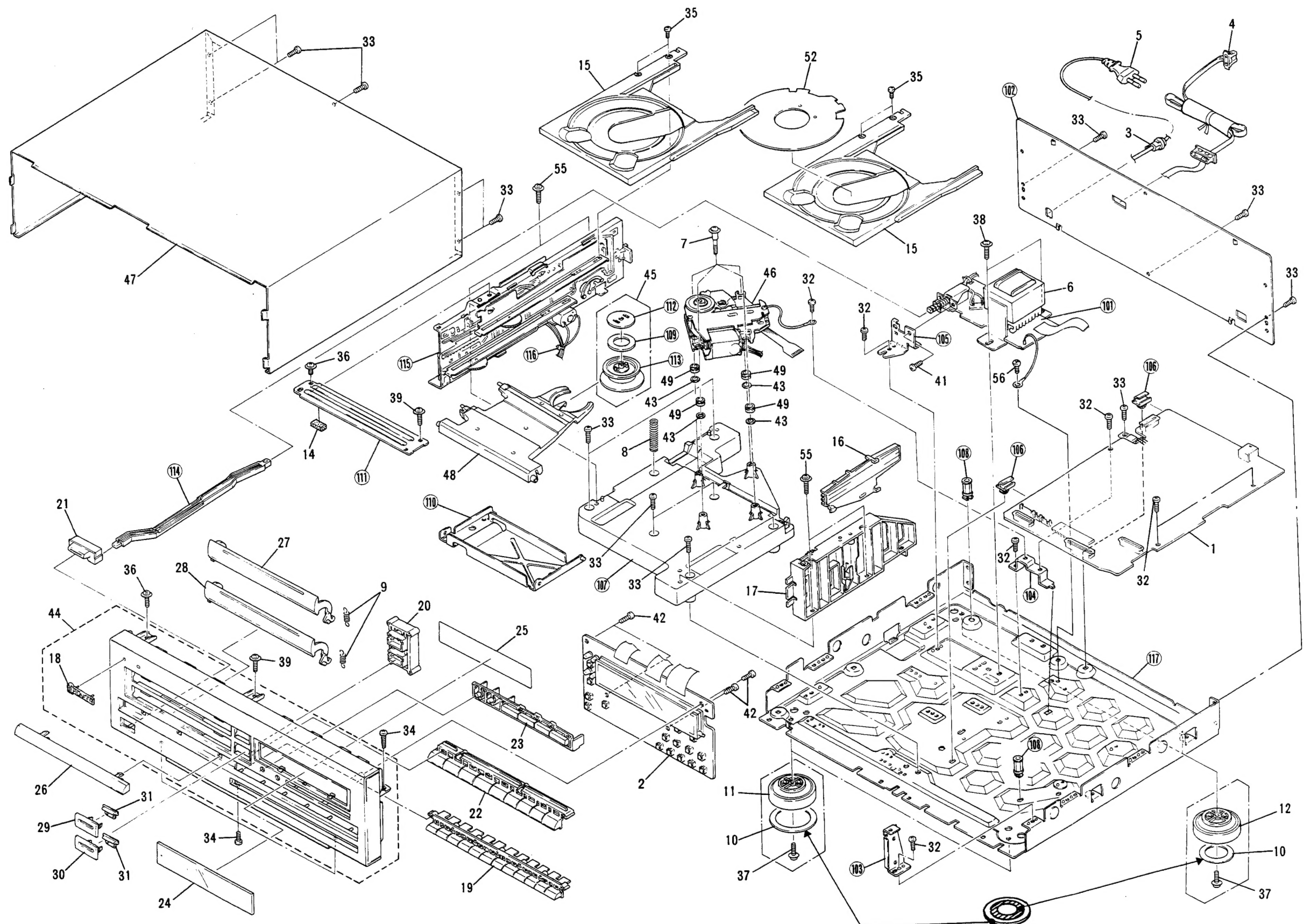
Parts List of Mechanism Section

Mark	No.	Part No.	Description
	1	CGDYX104M25	Semiconductive ceramic capacitor
	2	PBA1037	Screw M2×2.5
	3	PBH1008	Drive spring
	4	PBK1057	Plate spring
	5	PEB1072	Belt
	6	PLA1003	Drive screw
	7	PLA1004	Guide bar
	8	PNW1578	Carriage plate
	9	PNW1064	Disc table
	10	PNW1066	Pulley
	11	PNW1520	Mechanism chassis
	12	PSH1003	Slide switch (S101, INSIDE)
	13	PYY1109	Spindle motor assembly (with oil)
	14	PXM1002	Motor (CARRIAGE, LOADING)
	15	PWY1009	Pick-up assembly
	16	BPZ20P080FZK	Screw
	17	PMZ20P030FMC	Screw
	18	PYY1025	Motor assembly (CARRIAGE)
	19		.....
	20	PYY1091	Servo mechanism assembly
	21	PBA1035	Screw
	22	PBH1074	Spring
	23	PBH1076	Spring
	24	PEB1106	Belt
	25	PNW1478	Sync gear
	26	PNW1486	Gear
	27	PMZ20P030FMC	Screw
	28	PPZ26P080FMC	Screw
	29	PSZ26P050FMC	Screw
	30	WA32L060C035	Washer
	31	WT26D047D025	Washer
	32	YE25FUC	E ring
	33	PYY1089	Motor assembly (LOADING)
	34	PNB1180	Auxiliary arm (U)
	35	PNB1181	Auxiliary arm (L)
	36	PNW1481	Rack (U)
	37	PNW1482	Rack (L)
	38	PNW1483	Switch lever (U)
	39	PNW1484	Switch lever (S)
	40	PNW1485	Switch lever (L)
	41	PNW1487	Gear pulley
	42	PNW1488	Loading base
	43	PXT1025	Slide angle (U) unit
	44	PXT1026	Slide angle (L) unit

Mark	No.	Part No.	Description
	101		Earth lead unit
	102		Motor pulley
	103		Base plate
	104		Carriage M board
	105		Motor base
	106		Binder
	107		Loading base assembly
	108		SW board assembly

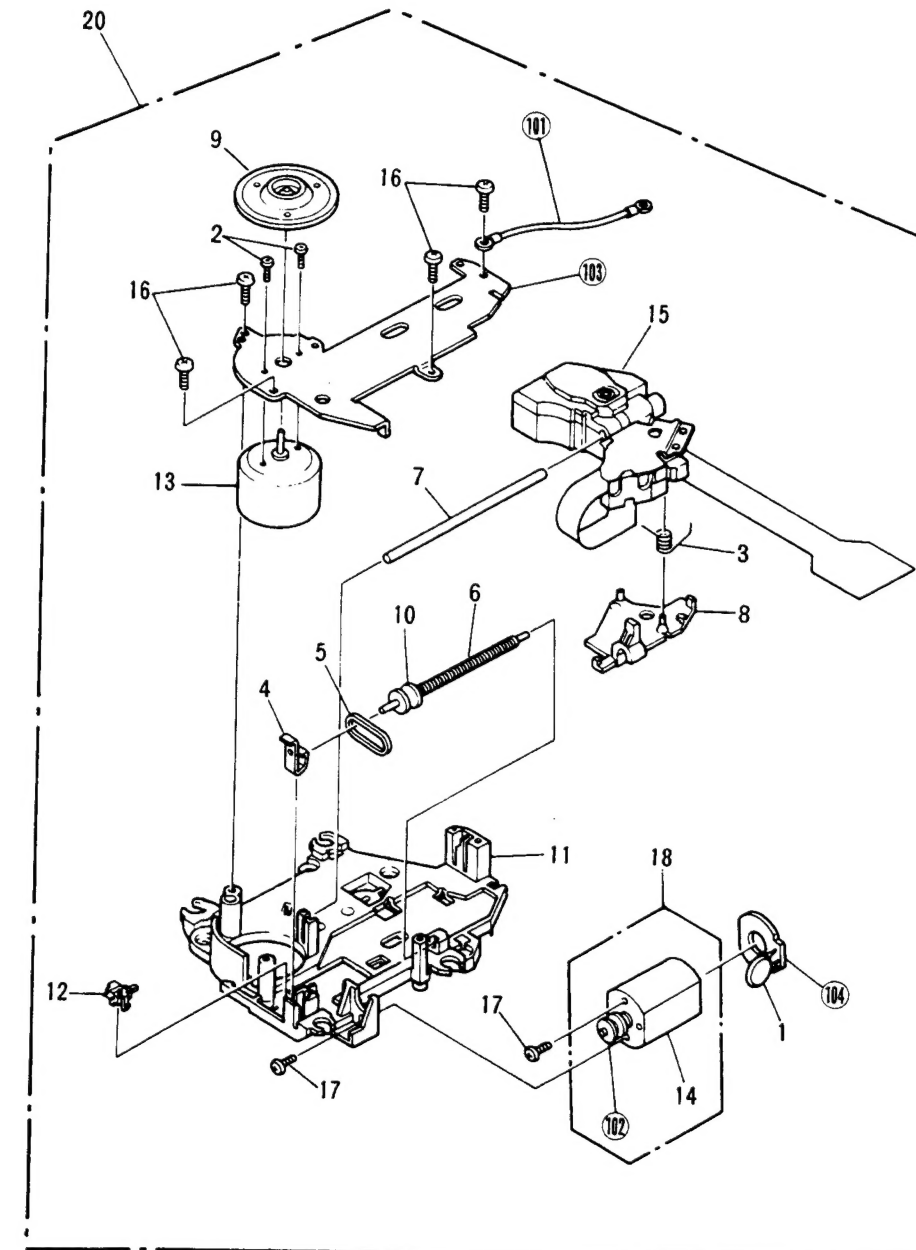
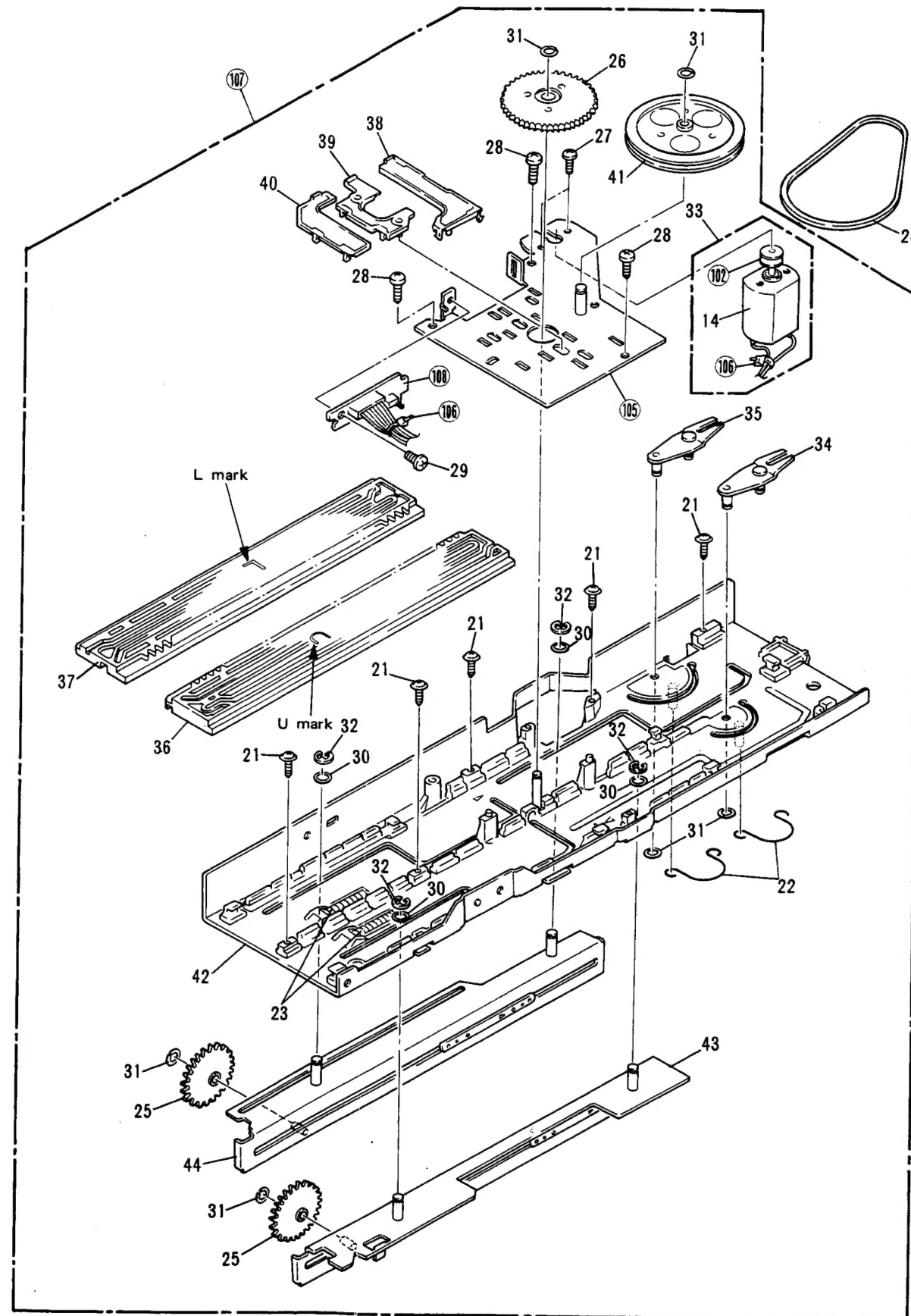
2. EXPLODED VIEWS AND PARTS LIST

2.1 EXTERIOR



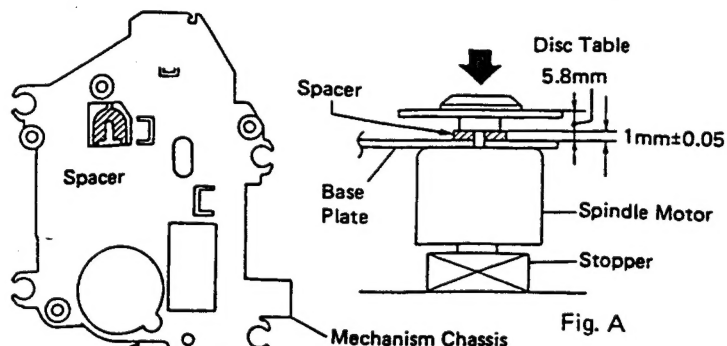
Note : Use it separately.

2.2 MECHANISM SECTION



- **Disc table installation**

When press fitting the disc table, be sure the bottom of the spindle motor contacts the stopper. As shown in Fig. A, insert the spacer (cut out from the mechanism chassis) between the disc table and the Base plate. Then press fit directly above. (With a pressure of about 9 kg.)



● HOW TO HOOK THE SERVO MECHANISM ASSEMBLY DRIVE SPRING

- Place the carriage plate in the outermost position.
- Hook the drive spring to the carriage plate spring hooking pin (A) with the shorter arm up, in such a position that the shorter arm forms a right angle with the pickup guide bar (see Fig-1).
- Pass the guide bar through the pickup, insert the guide bar right side into the corresponding spot on the mechanism chassis, then insert its left side into the corresponding spot on the mechanism chassis so that the carriage plate spring hooking pin (A) gets into the pickup long slot (B).
- After moving the drive spring longer arm to the left (① direction), hook it to the carriage plate hook (C).

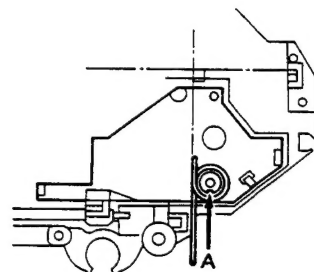


Fig.-1

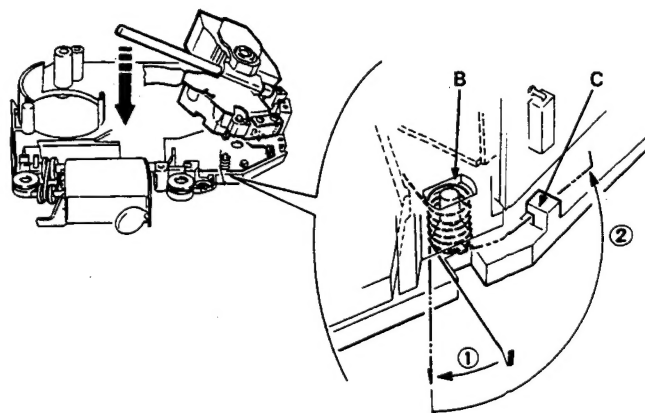
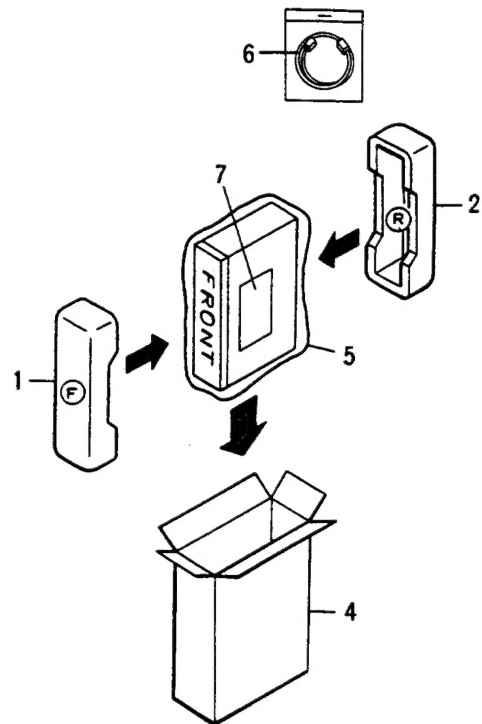


Fig.-2

3. PACKING

Parts List of Packing

Mark	No.	Part No.	Description
	1	PHA1104	Protector (F)
	2	PHA1105	Protector (R)
	3	PHC1043	Spacer (in the tray 2)
	4	PHG1390	Packing case
	5	Z23-007	Sheet
	6	AKX1031	Optical cable
	7	PRE1103	Operating instructions (English, French, German, Italian, Dutch, Spanish, Portugues, Swedish)



4. LINE VOLTAGE SELECTION

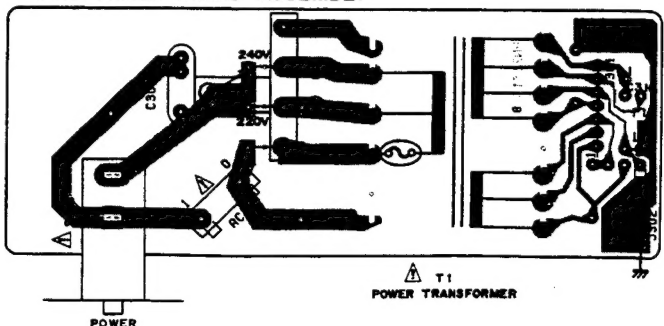
1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the position of the jumper Ⓐ as follows.

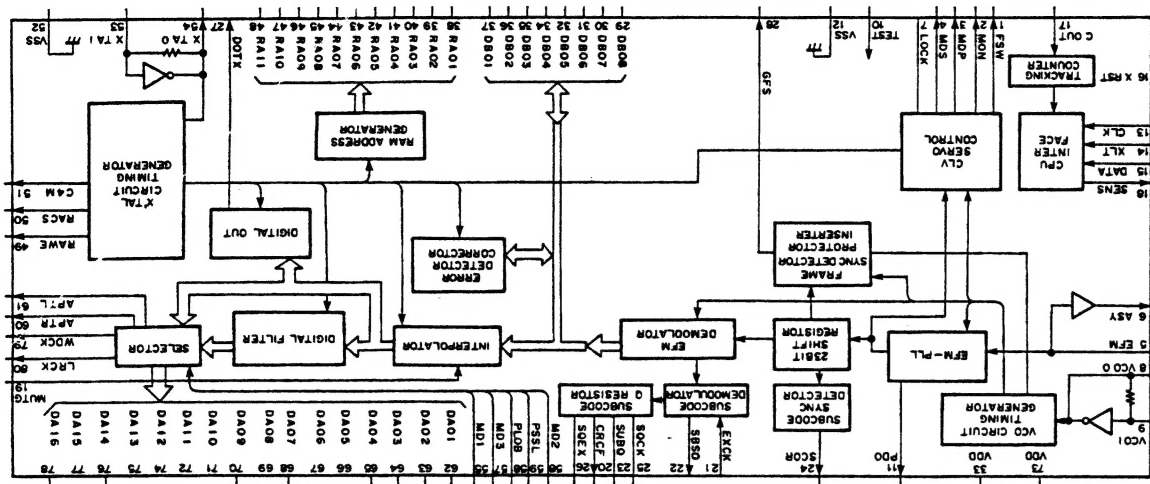
Voltage	Jumper Ⓐ position
220V	①
240V	②

4. Stick the line voltage label on the rear panel.

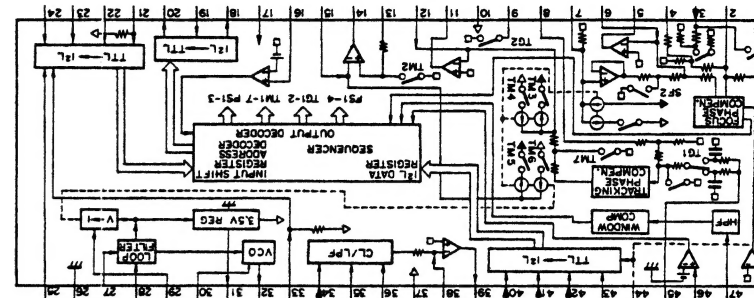
Description	Part No.
220V label	AAX-193
240V label	AAX-192

TRANSFORMER BOARD ASSEMBLY





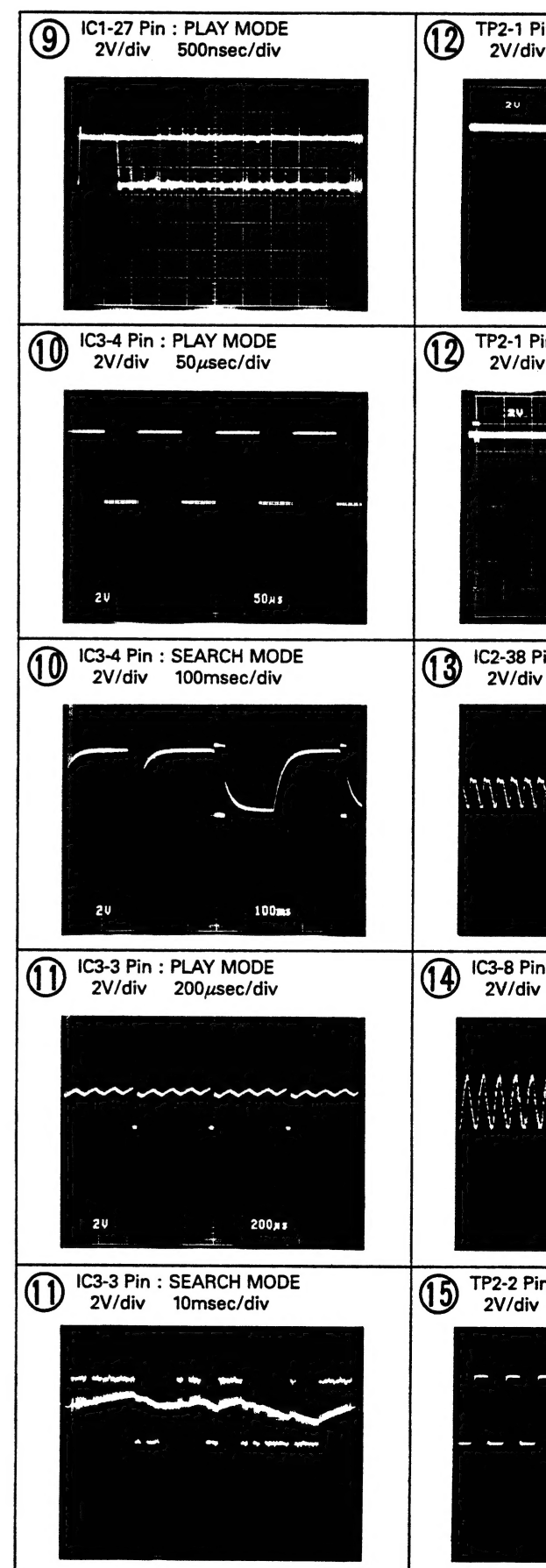
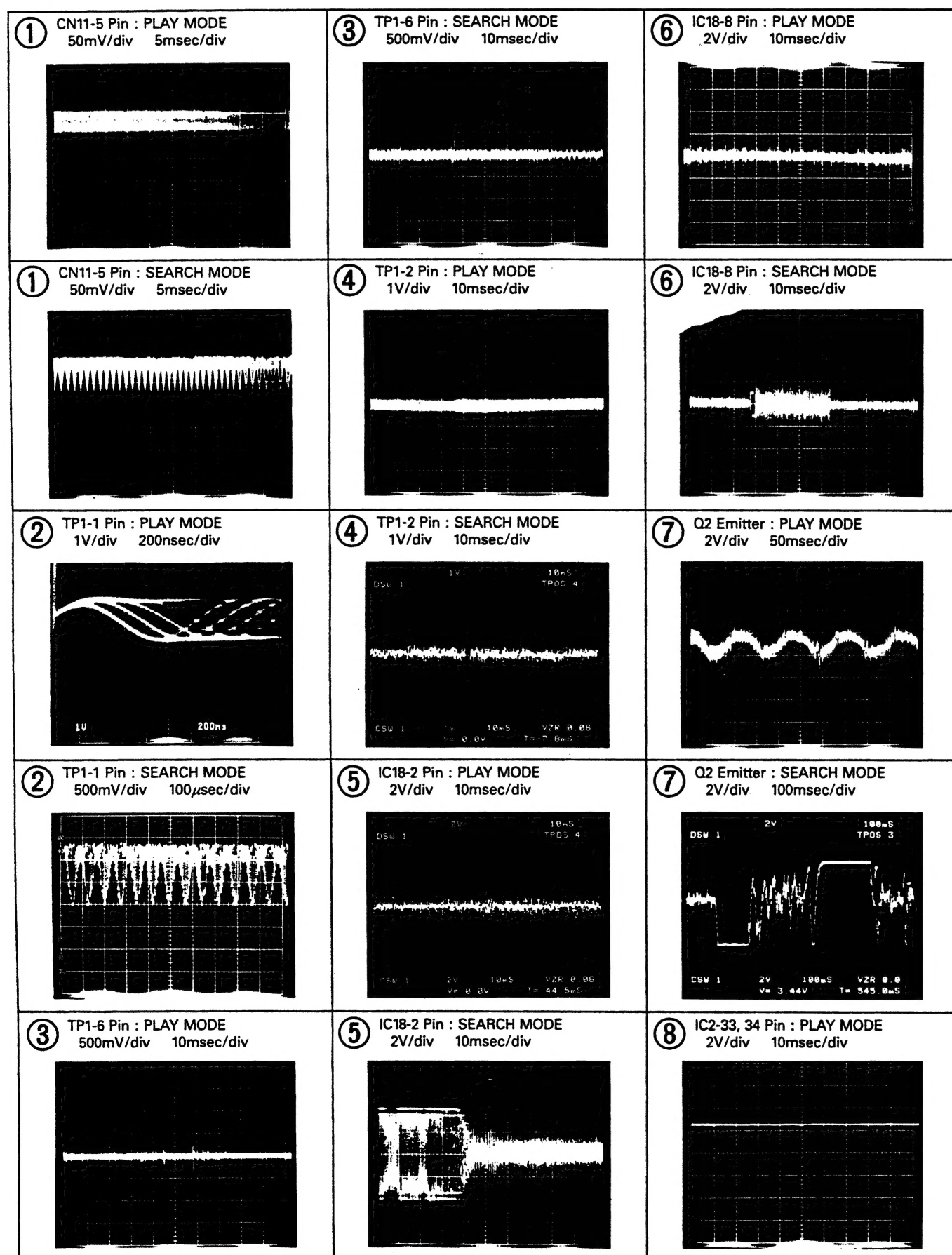
CXD1135QZ

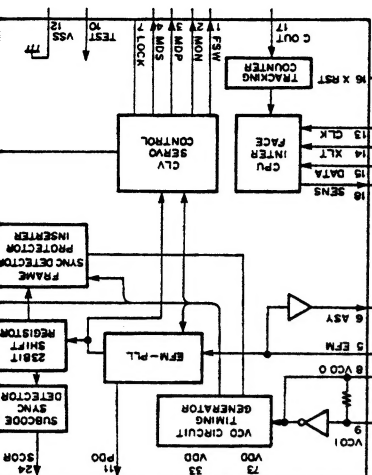


A1082BS

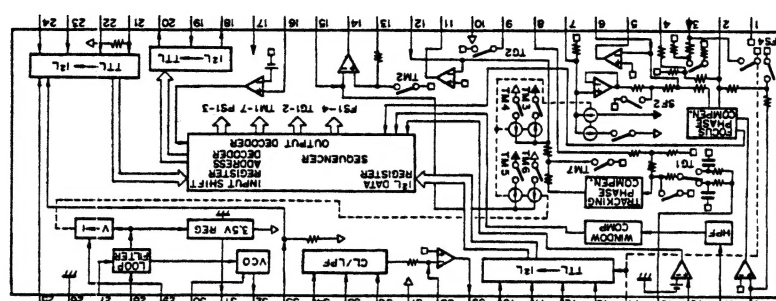
Wave Forms

NOTE : The encircled numbers denote measuring points in the schematic diagram.

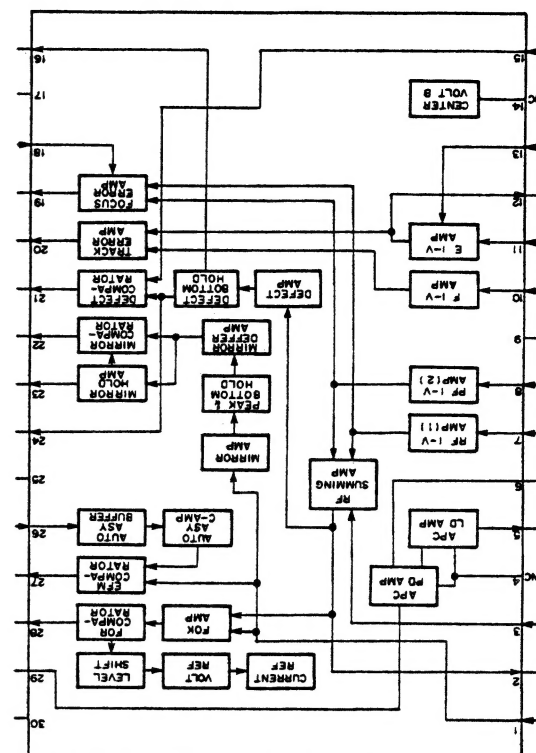




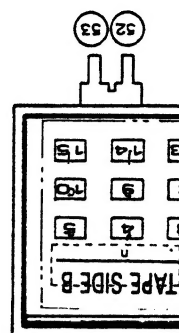
CXD1135QZ



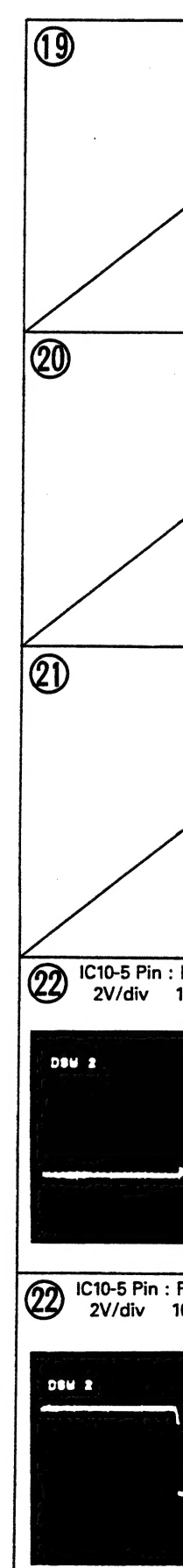
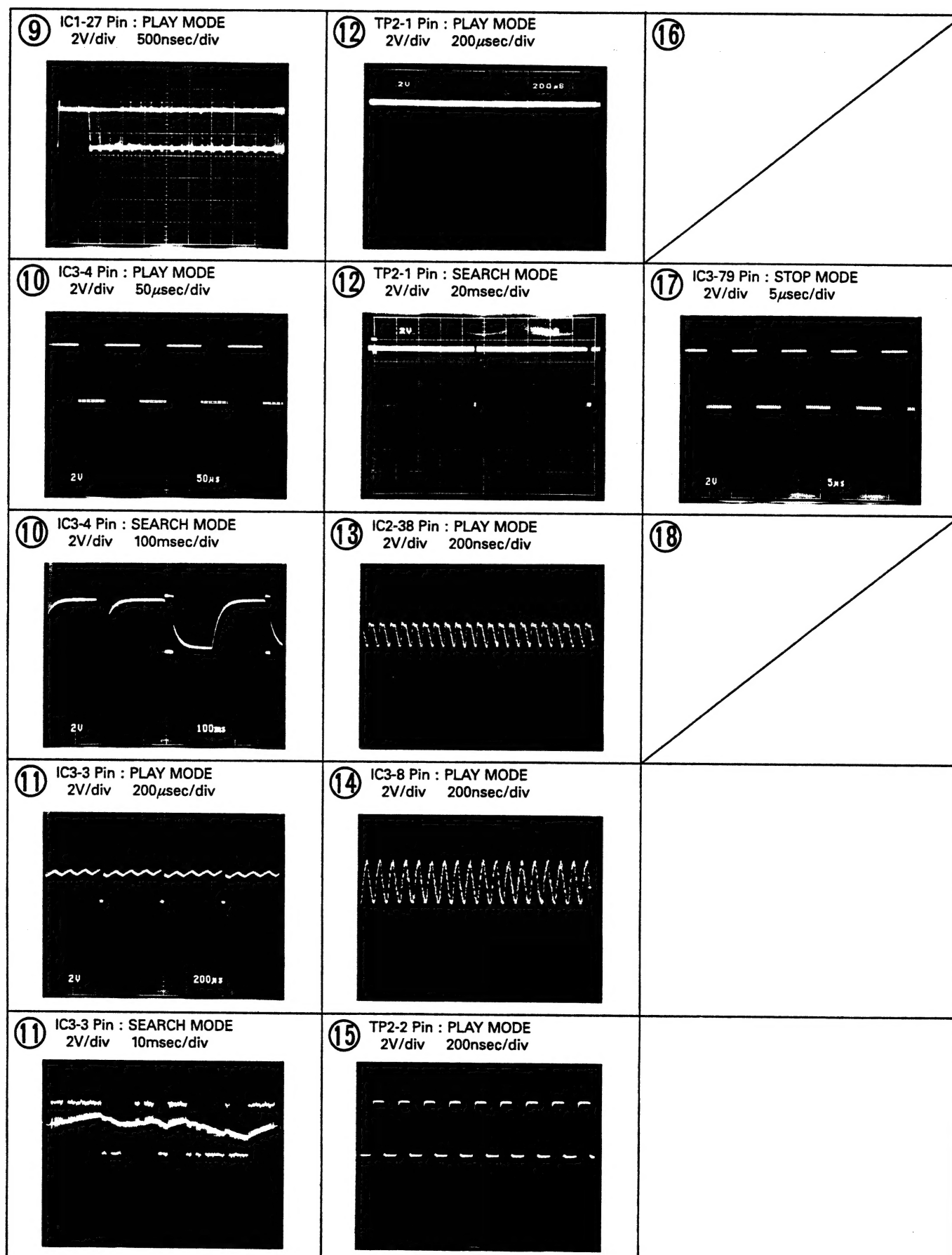
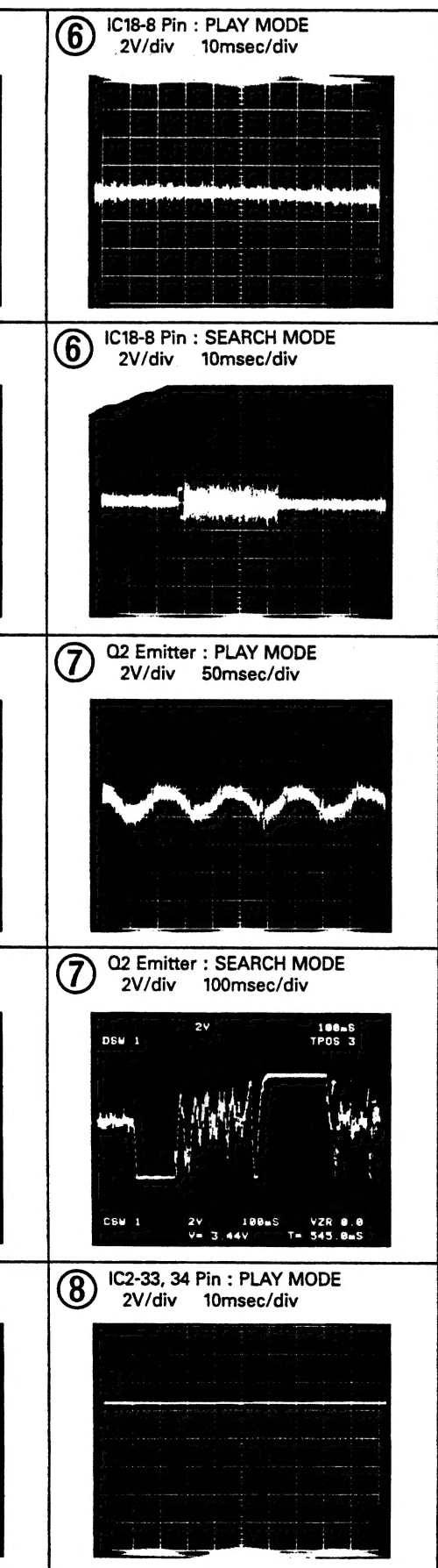
CXA1082BS



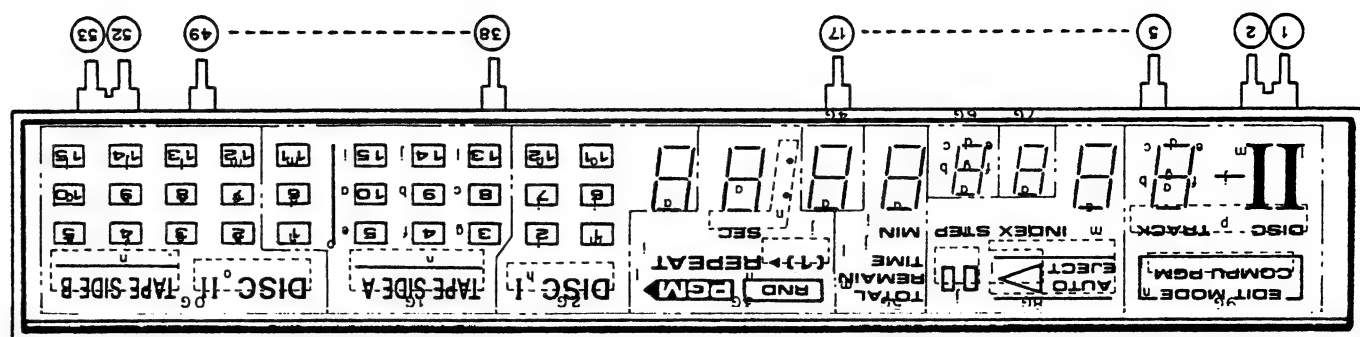
CXA1081S



The encircled numbers denote measuring points in the schematic diagram.

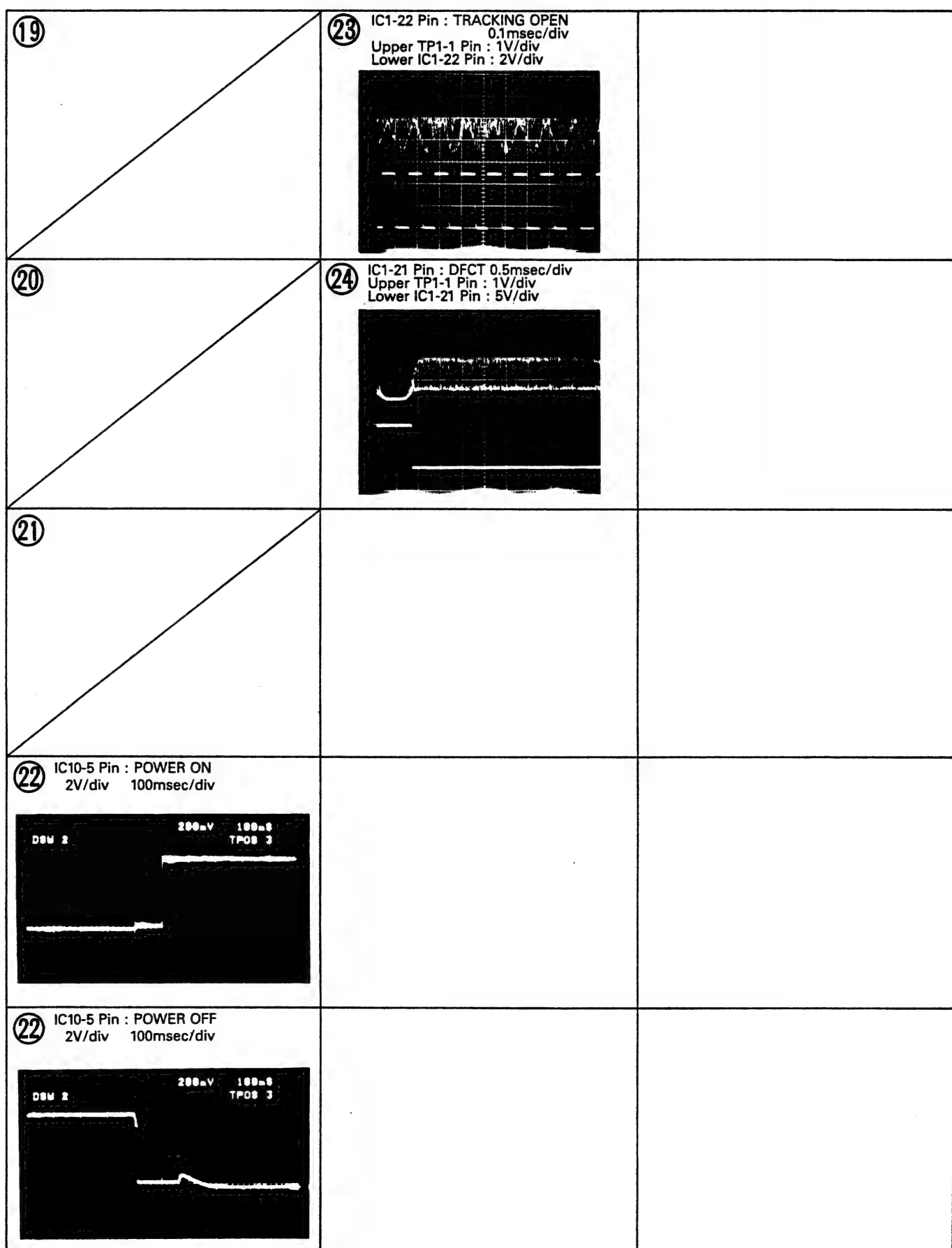
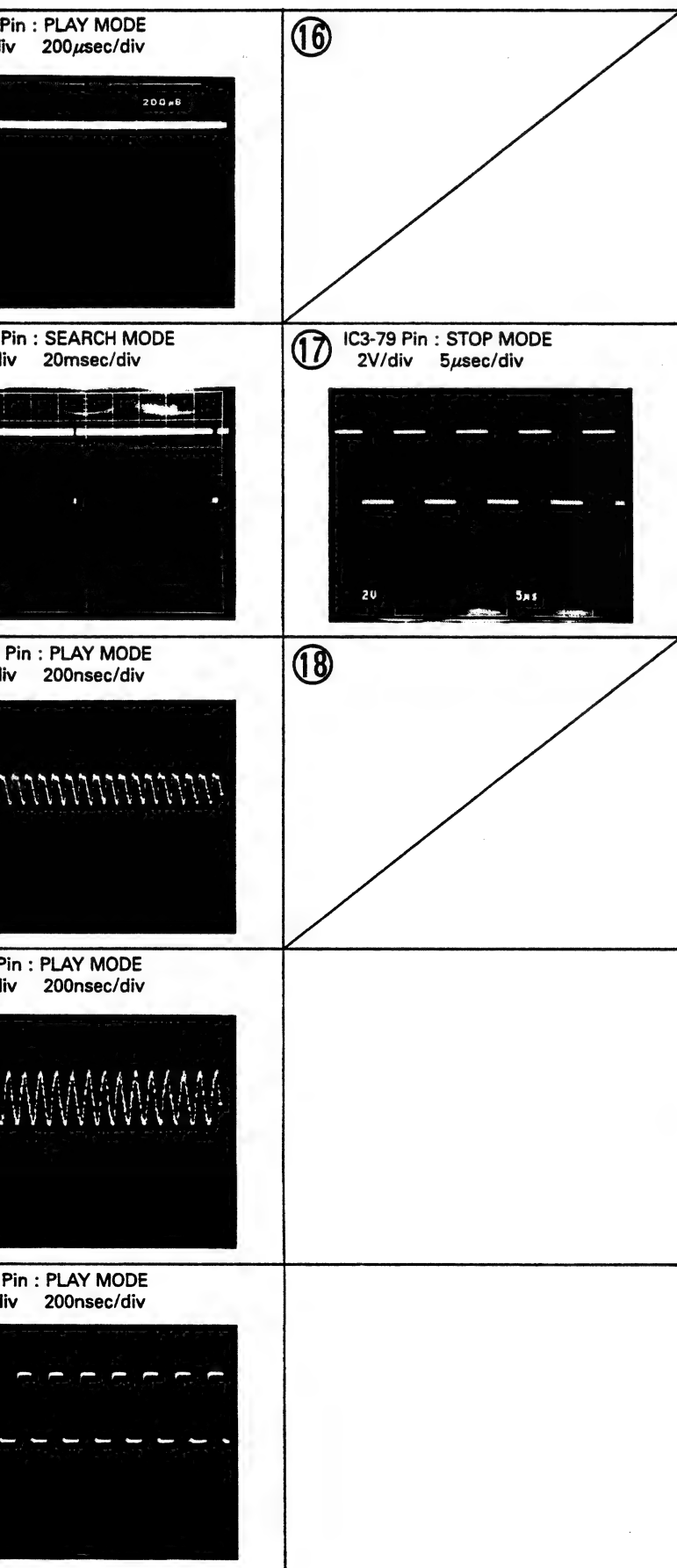


CXA1081S



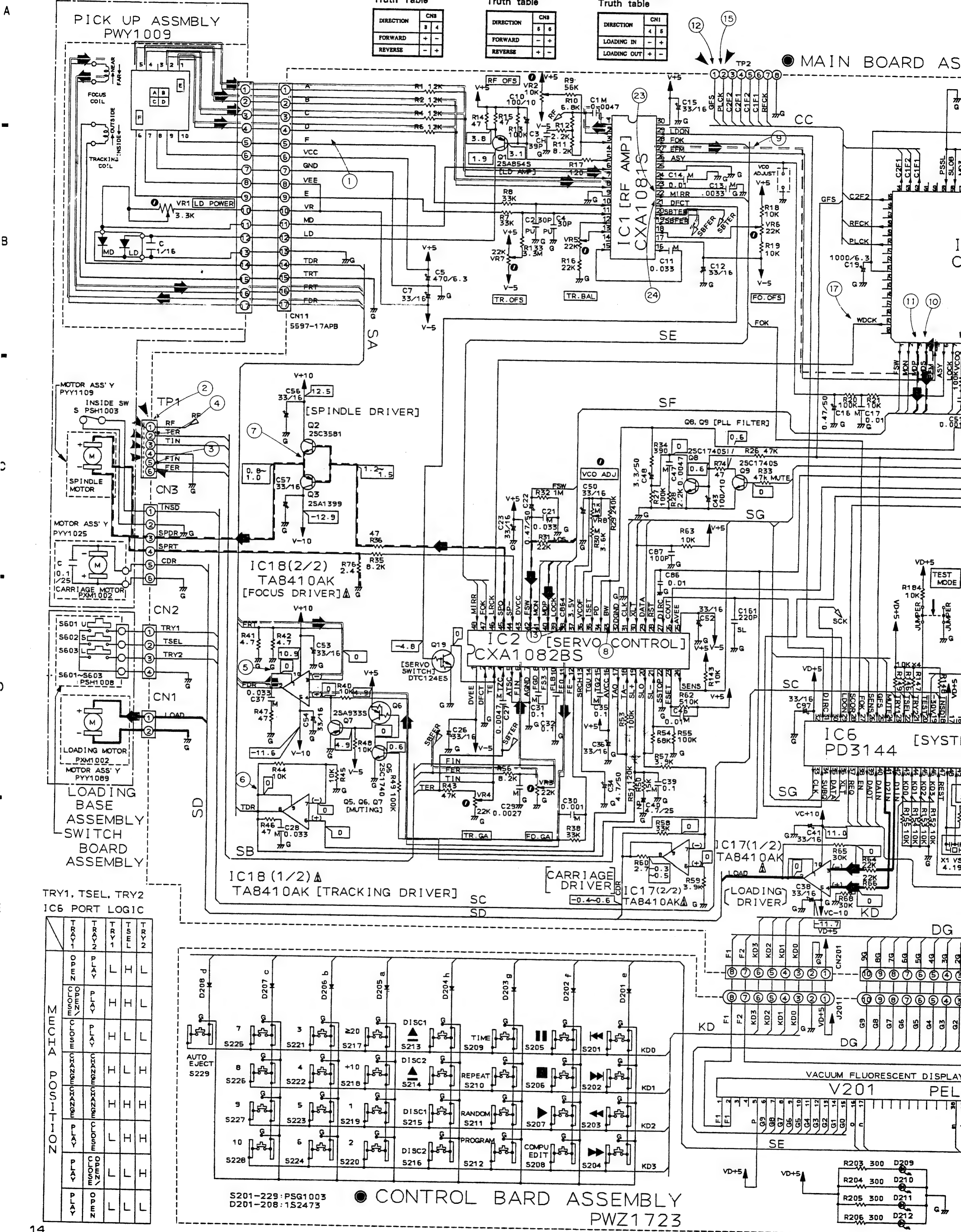
● GRID DATA OF FLUORESCENT INDICATOR TUBE V201 (PEL1033)

PD-Z 560T



5. SCHEMATIC DIAGRAM

SERVO MECHANISM ASSEMBLY
PXA1206



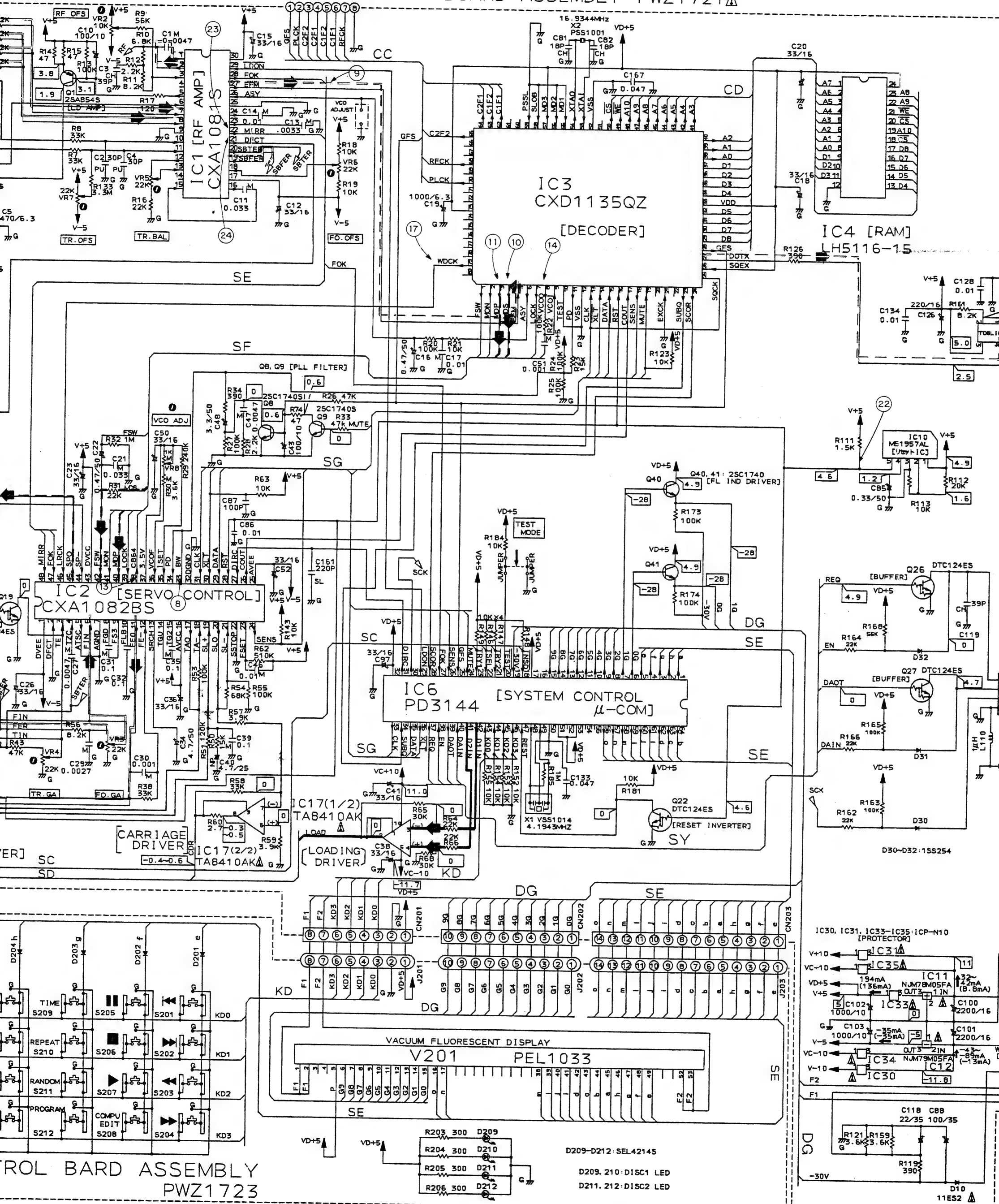
Carriage motor
Truth table

DIRECTION	CN8
FORWARD	- +
REVERSE	+ -

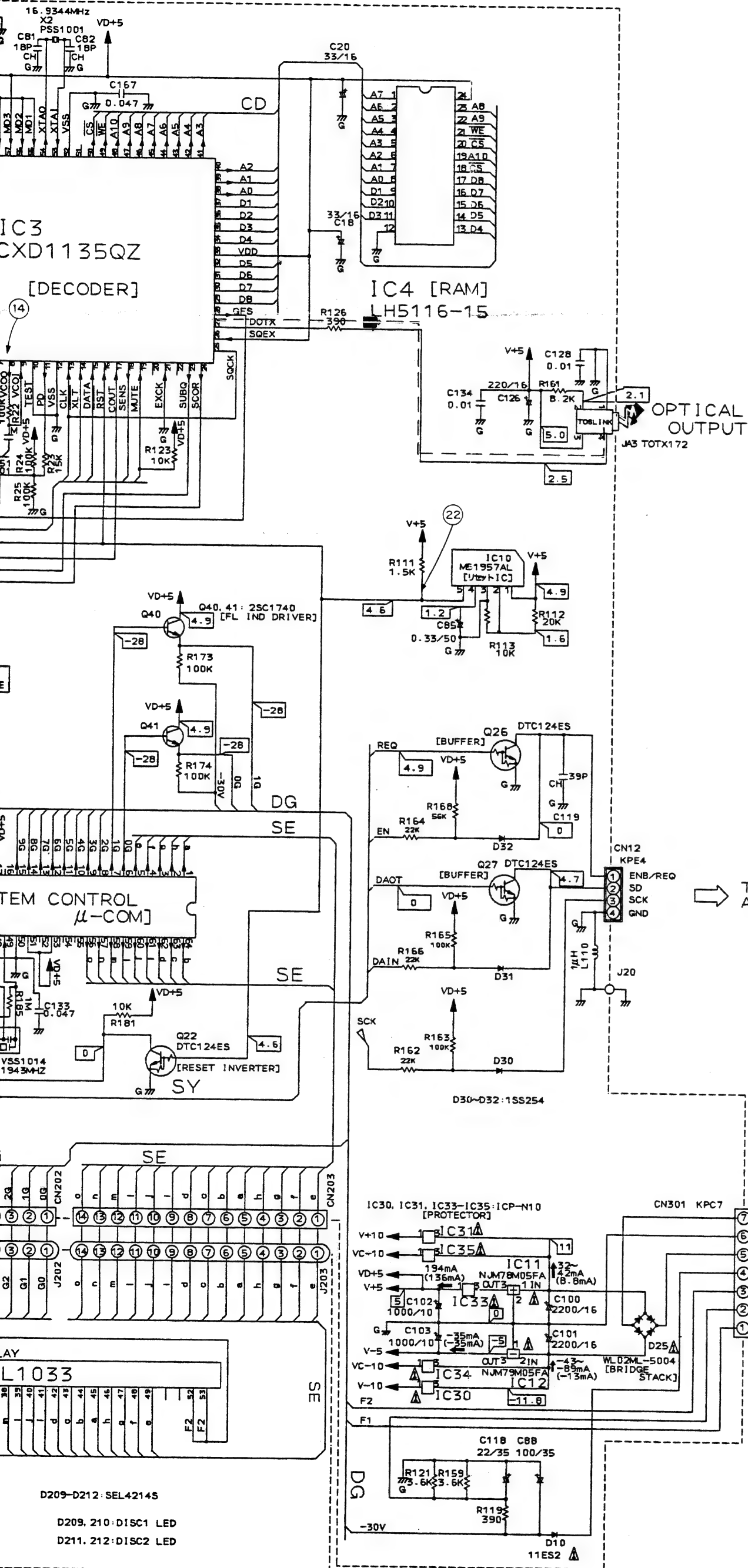
Loading motor
Truth table

DIRECTION	CN1
LOADING IN	- +
LOADING OUT	+ -

MAIN BOARD ASSEMBLY PWZ1721A



ASSEMBLY PWZ1721A



1. CAPACITORS

Units: μ F unless otherwise noted (P: pF)
 NP Non-polarized electrolytic
 M Mylar CQMA
 CH Ceramic CCCCH
 SL Ceramic CCCSL
 PU Axial ceramic CCPUSL
 Ceramic with no particular specification CKCYF
 Electrolytic with no particular specification CEAS
 (except for the servo mechanism assembly)
 Indicated as capacity/voltage; voltage resistance is 50 V unless otherwise noted (except for electrolytic capacitors)

2. RESISTORS

Units: Ω unless otherwise noted (K: k Ω , M: M Ω)
 Nominal wattage: 1/8 W unless otherwise noted (1/8W, 1/4W)
 Tolerance: $\pm 5\%$ unless otherwise noted
 (F: $\pm 1\%$, G: $\pm 2\%$, K: $\pm 10\%$, M: $\pm 20\%$)
 Metal-film resistor
 Unmarked resistors are carbon-film resistors.

3. POTENTIOMETERS

Units: Ω unless otherwise noted (K: k Ω , M: M Ω)
 VRTS6VS
 Unmarked potentiometers are VRTB6VS.
 (except for the servo mechanism assembly)

4. VOLTAGE AND CURRENT

DC voltage during play (V)
 mA : Direct current during play
 Direct current in the stop mode is shown between brackets ()

5. Others

* : Chassis ground
 G : Ground
 ABC : Low-active signal
 The arrows (\Rightarrow) indicate the signal route.
 The \odot marks indicate adjustment points.
 Always use the noted part at the Δ marks.
 Circuits are subject to change without notice for improvement purposes.

6. SWITCHES (Switch positions are shown underlined)

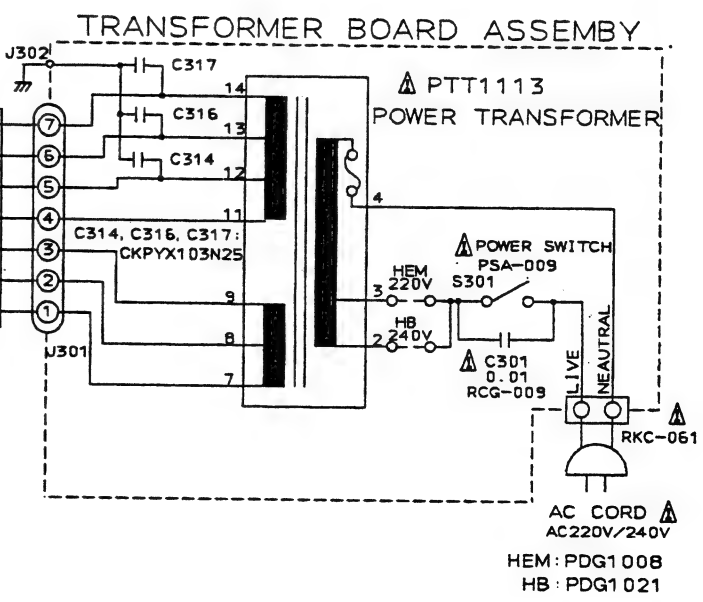
Control board assembly
 S201: \llcorner S217: ≥ 20
 S202: \llcorner S218: +10
 S203: \llcorner S219: 1
 S204: \llcorner S220: 2
 S205: \llcorner S221: 3
 S206: \llcorner S222: 4
 S207: \llcorner S223: 5
 S208: COMPU EDIT S224: 6
 S209: TIME S225: 7
 S210: REPEAT S226: 8
 S211: RANDOM PLAY S227: 9
 S212: PROGRAM S228: 10
 S213: DISC I \blacktriangle S229: AUTO EJECT
 S214: DISC II \blacktriangle
 S215: DISC I SELECT
 S216: DISC II SELECT

Transformer board assembly

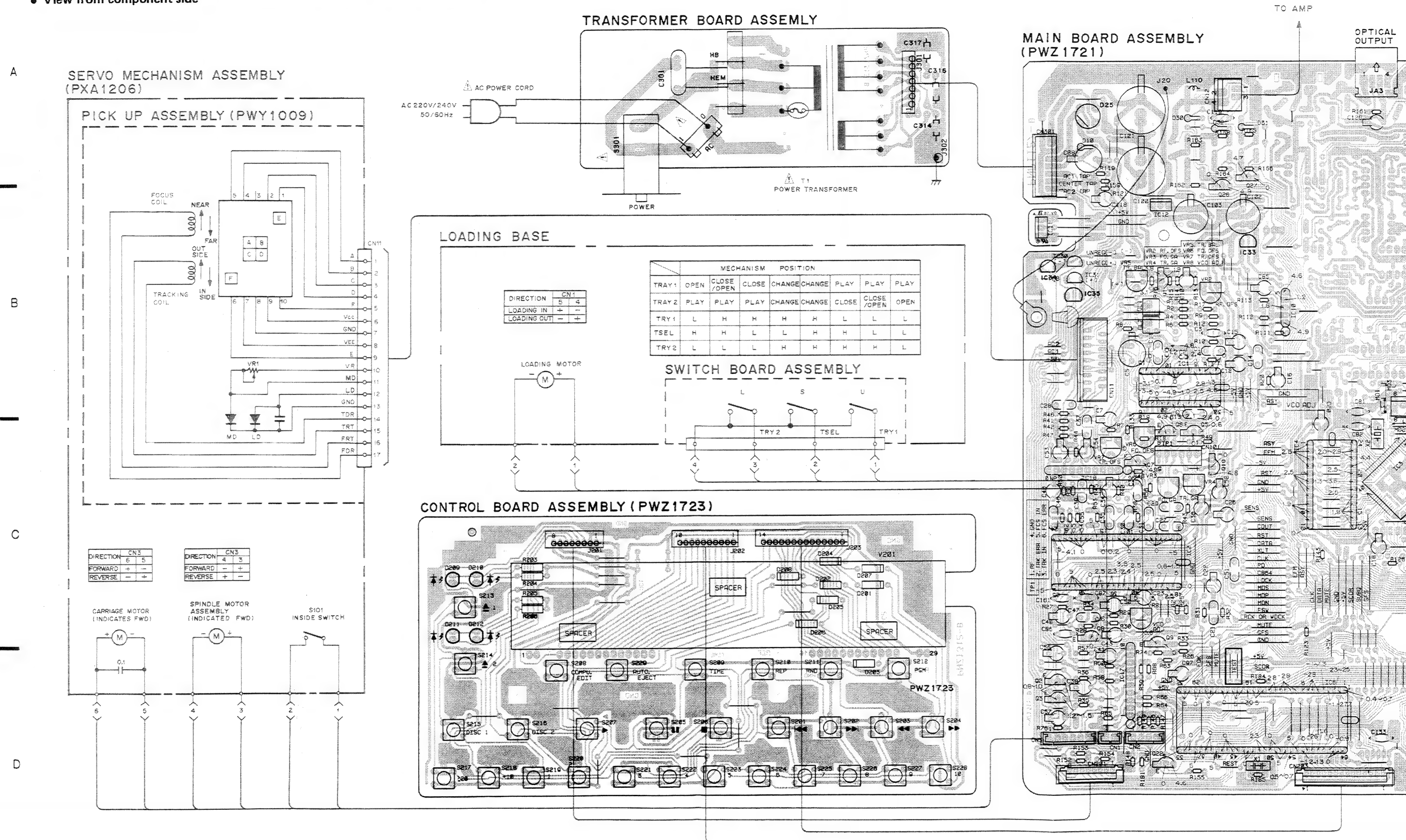
S301: POWER ON-OFF
 Switch not located on a board assembly
 S101: INSIDE ON-OFF

TO AMP
 CONNECTING CABLE
 PDE1067

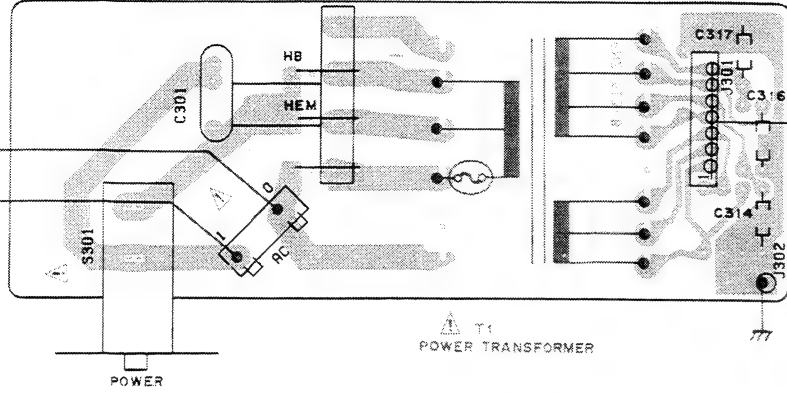
Focus servo loop line
 Signal route
 Tracking servo loop line
 Carriage servo line
 Loading motor route
 Spindle servo route
 Test point



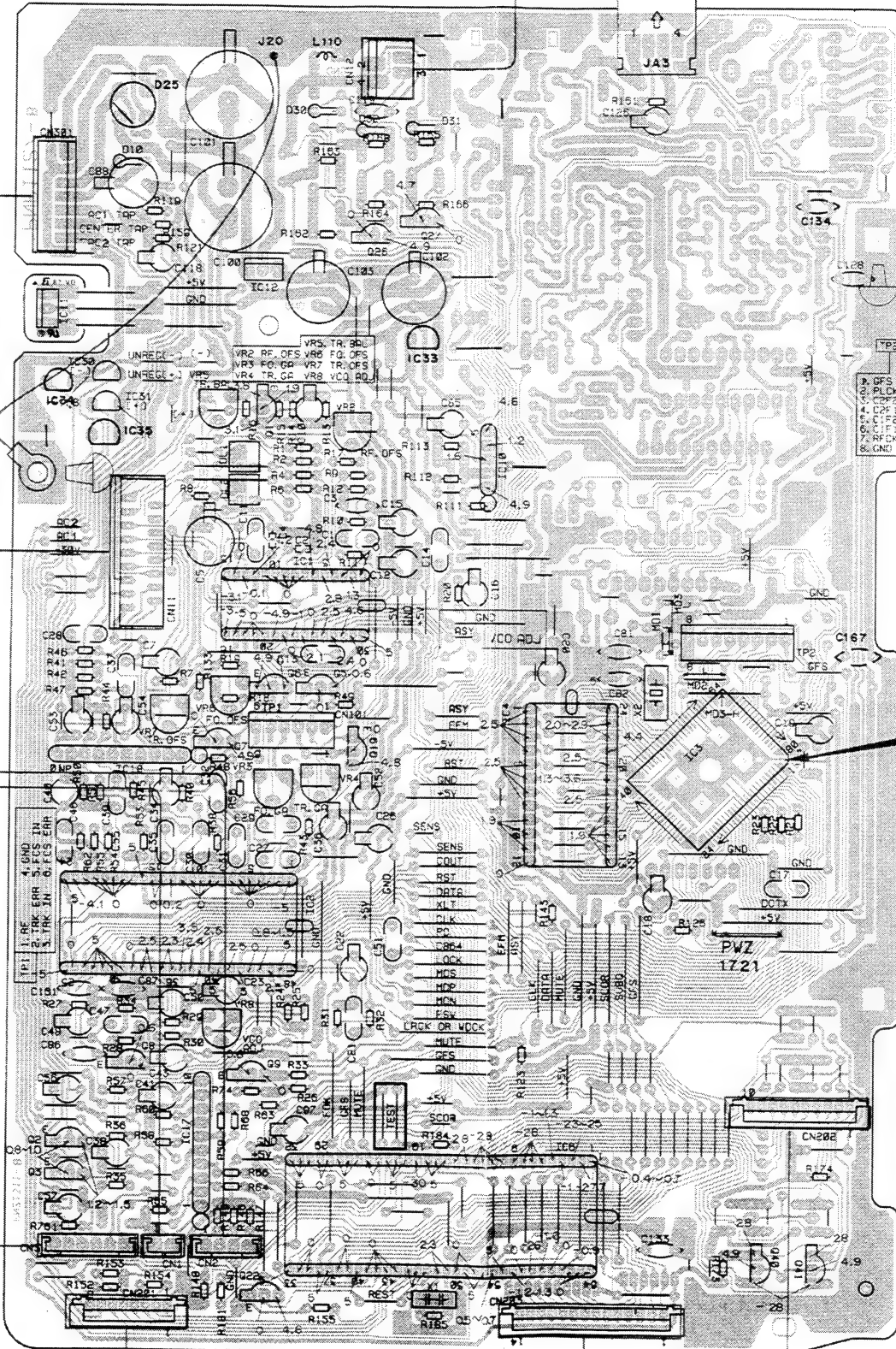
- View from component side



TRANSFORMER BOARD ASSEMBLY



MAIN BOARD ASSEMBLY (PWZ1721)



TO AMP

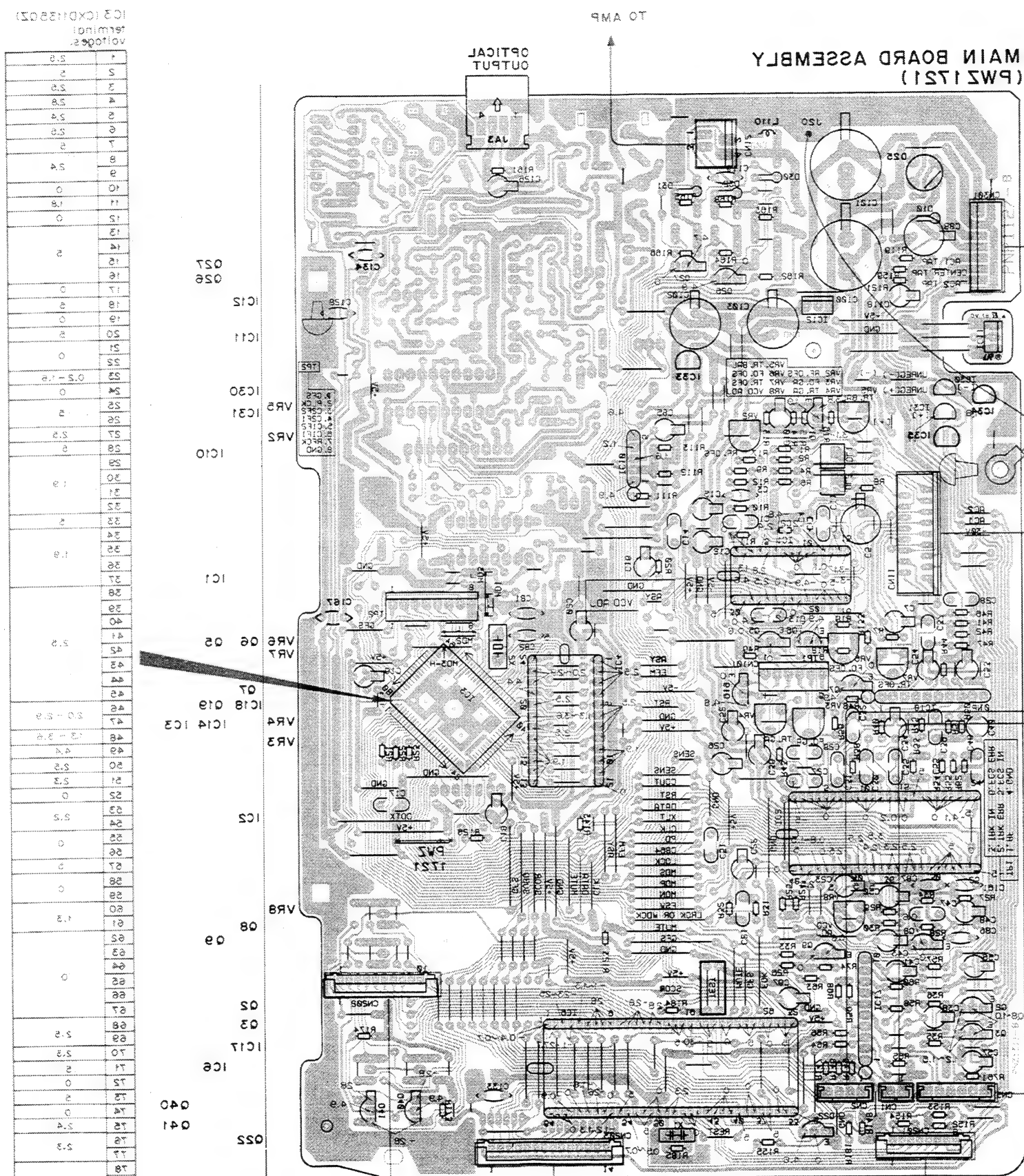
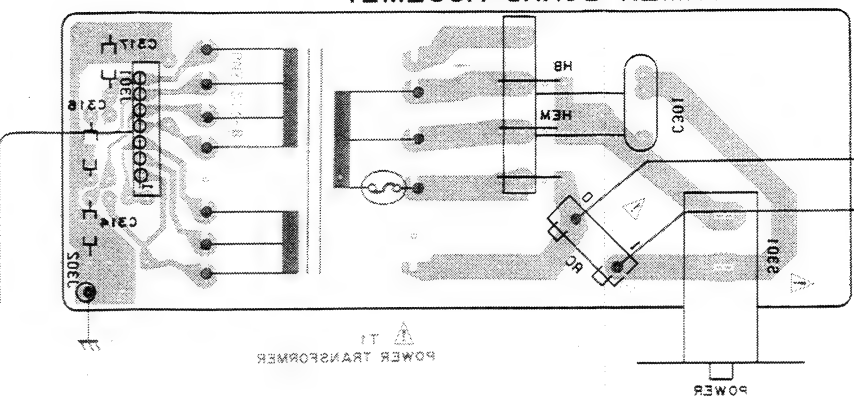
OPTICAL OUTPUT

IC3 (CXD1135QZ)
terminal
voltages.

1	2.5
2	5
3	2.5
4	2.8
5	2.4
6	2.5
7	5
8	2.4
9	2.4
10	0
11	1.8
12	0
13	0
14	5
15	0
16	0
17	0
18	5
19	0
20	5
21	0
22	0
23	0.2-1.6
24	0
25	5
26	5
27	2.5
28	5
29	5
30	1.9
31	5
32	5
33	5
34	5
35	1.9
36	5
37	5
38	5
39	5
40	5
41	2.5
42	2.5
43	2.5
44	2.5
45	2.5
46	2.5
47	2.5
48	1.3-3.6
49	4.4
50	2.5
51	2.3
52	0
53	2.2
54	0
55	0
56	0
57	5
58	0
59	0
60	1.3
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	2.5
69	2.3
70	2.3
71	5
72	0
73	5
74	0
75	2.4
76	2.3
77	2.3
78	2.5
79	2.5
80	2.5

P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zener diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styro capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor (Noiseless)
		Electrolytic capacitor (Polarized)
		Electrolytic capacitor (Polarized)
		Power capacitor
		Semi-fixed resistor
		Resistor array
		Resistor
		Resonator
		Thermistor

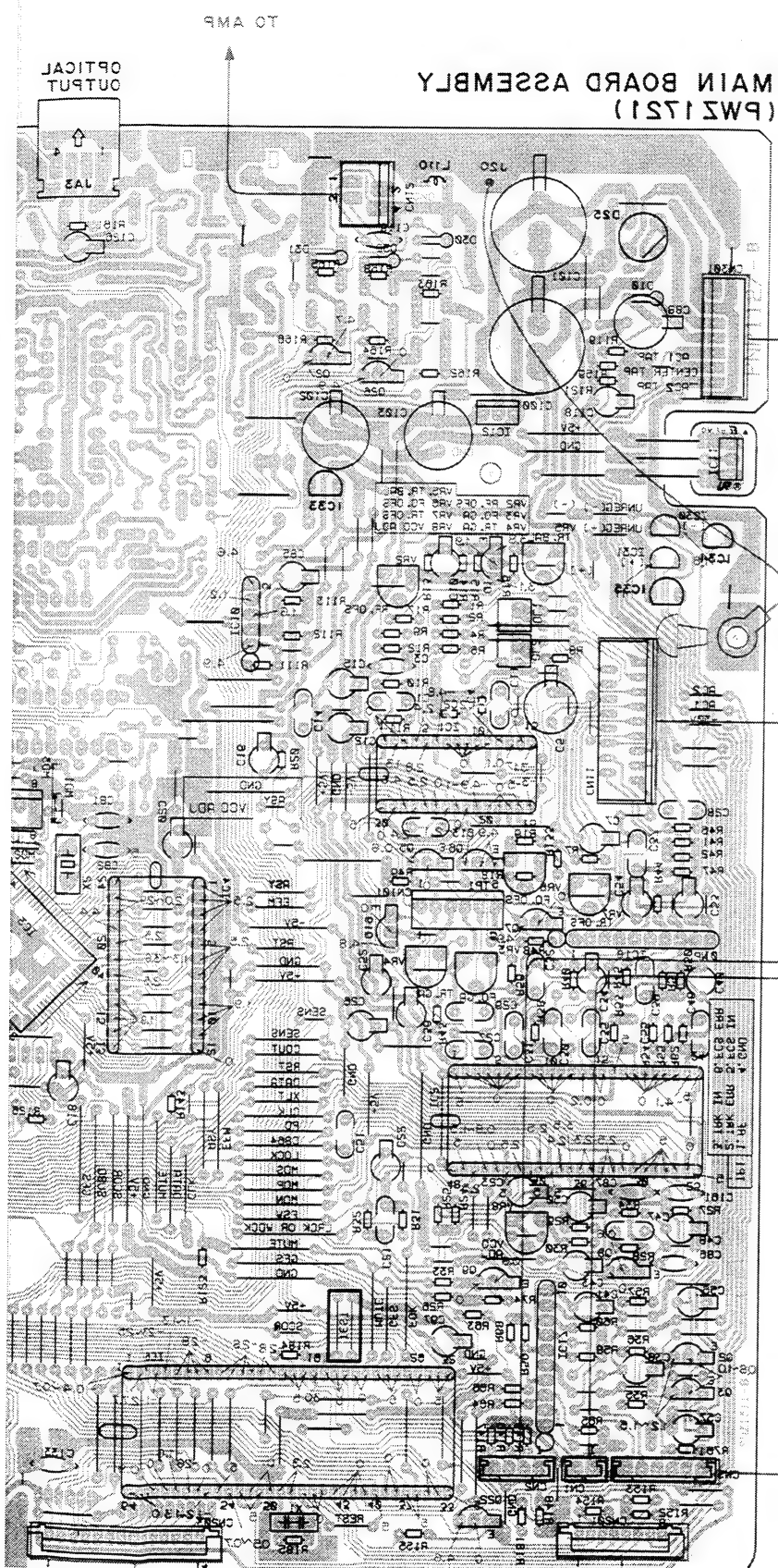
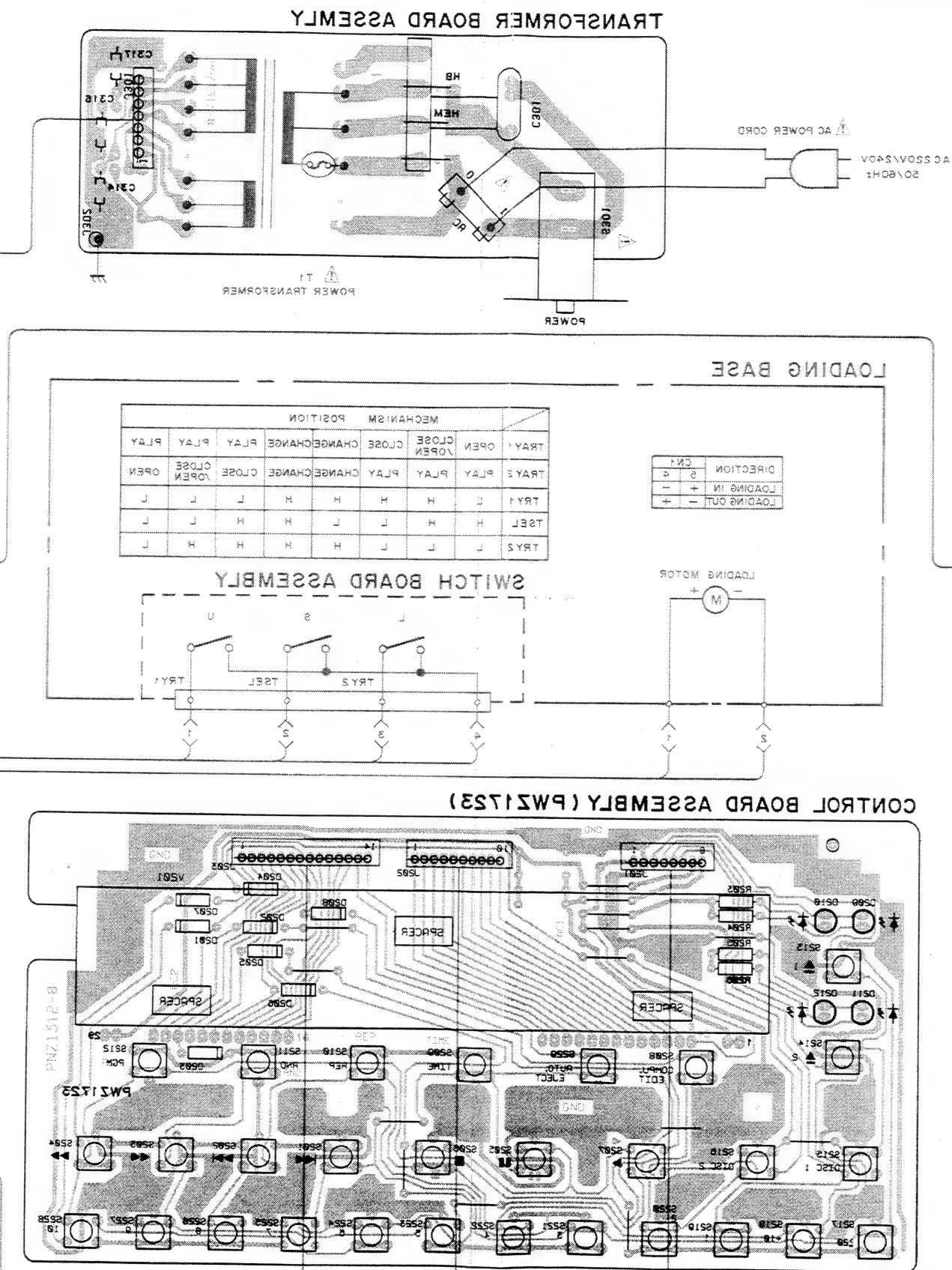
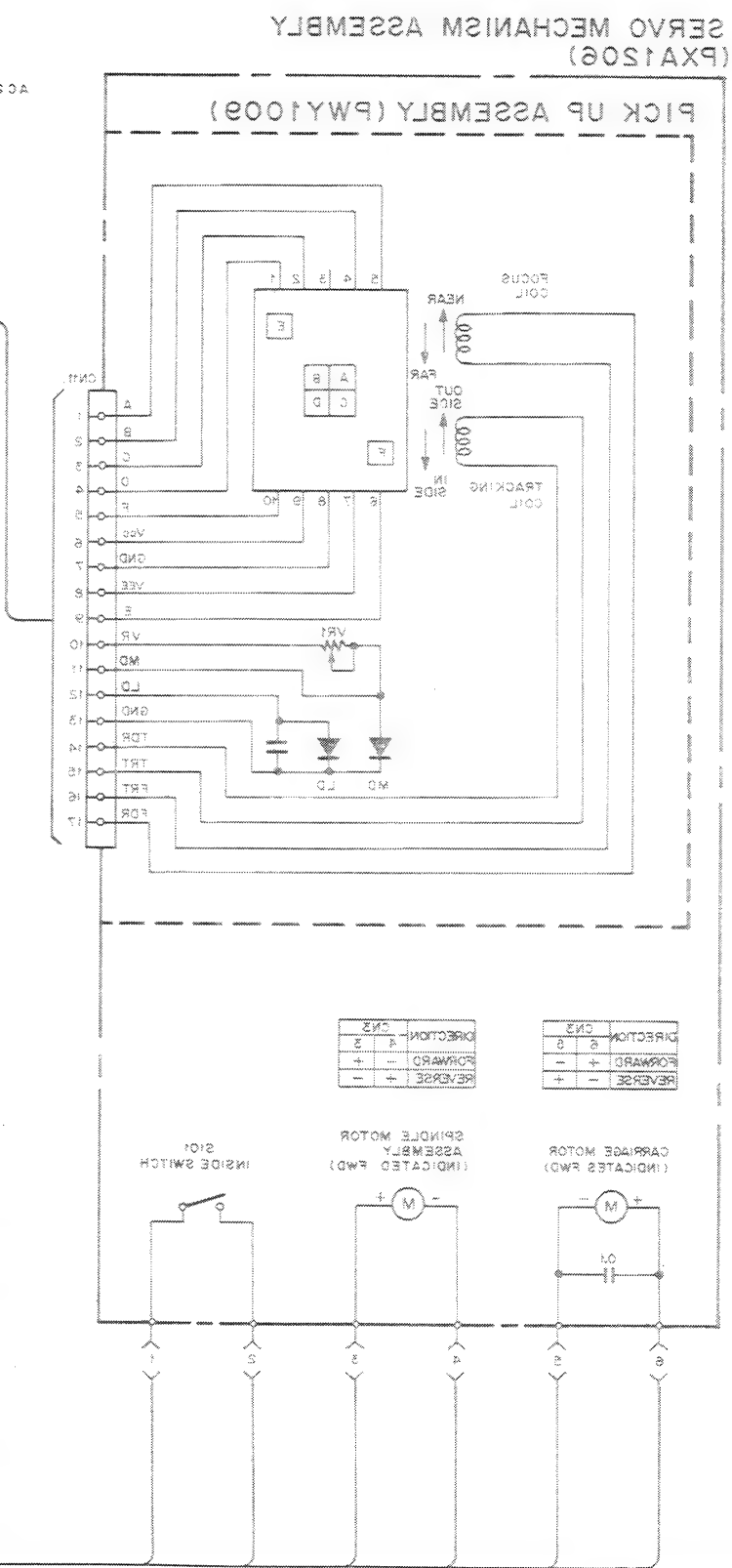
1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with shows negative terminal.
4. The diode marked with shows cathode side.
5. The transistor terminal marked with shows emitter.



Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1970	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

6. P.C. BOARDS CONNECTION DIAGRAM

- View from soldering side



● EACH IC'S TERMINAL VOLTAGE (PLAY MODE)

IC1 (CXA1081S)

Pin No	Voltages	Pin No	Voltages
1	0	16	-3
2	1.3	17	-5
3	0	18	0
4	2.4	19	0
5	2.8	20	0
6	-4.8	21	-4.9
7	0	22	0
8	0	23	-1
9	0	24	-2.1
10	0	25	0
11	0	26	2.5
12	-1.2	27	2.4
13	-0.1	28	4.6
14	0	29	0
15	-3.1	30	5

IC2 (CXA1082BS)

Pin No	Voltages	Pin No	Voltages
1	-5	25	-5
2	0	26	0
3	0	27	5
4	0	28	5
5	0	29	5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	2.5
10	0	34	2.5
11	0	35	2.3
12	0	36	2.3
13	0.2	37	3.5
14	0	38	2.4
15	0	39	5
16	5	40	2.5
17	0	41	5
18	0	42	2.5
19	0	43	5
20	0	44	0
21	0	45	0.8~1.5
22	0	46	2.5
23	-4.1	47	5
24	5	48	0

IC3 (CXD1135QZ)

Pin No	Voltages	Pin No	Voltages	Pin No	Voltages
1	2.5	28	5	55	0
2	5	29	1.9	56	0
3	2.5	30	1.9	57	5
4	2.8	31	1.9	58	0
5	2.4	32	1.9	59	0
6	2.5	33	5	60	1.3
7	5	34	1.9	61	1.3
8	2.4	35	1.9	62	0
9	2.4	36	1.9	63	0
10	0	37	1.9	64	0
11	1.8	38	2.5	65	0
12	0	39	2.5	66	0
13	5	40	2.5	67	0
14	5	41	2.5	68	2.5
15	5	42	2.5	69	2.5
16	5	43	2.5	70	2.3
17	0	44	2.5	71	5
18	5	45	2.5	72	0
19	0	46	2.0~2.9	73	5
20	5	47	2.0~2.9	74	0
21	0	48	1.3~3.6	75	2.4
22	0	49	4.4	76	2.3
23	0.2~1.6	50	2.5	77	2.3
24	0	51	2.3	78	2.5
25	5	52	0	79	2.5
26	5	53	2.2	80	2.5
27	2.5	54	2.2		

IC4 (LH5116-15)

Pin No	Voltages	Pin No	Voltages
1	2.5	13	1.9
2	2.5	14	1.9
3	2.5	15	1.9
4	2.5	16	1.9
5	2.5	17	1.9
6	2.5	18	2.5
7	2.5	19	1.3~3.6
8	2.5	20	2.5
9	1.9	21	4.4
10	1.9	22	2.0~2.9
11	1.9	23	2.0~2.9
12	0	24	5

IC6 (PD3144A)

Pin No	Voltages	Pin No	Voltages	Pin No	Voltages	Pin No	Voltages
1	-0.4~0.7	17	5	33	5	49	2.3
2	-27.7	18	5	34	0	50	0
3	-23 ~25	19	-30	35	0	51	5
4	-1	20	5	36	5	52	0
5	-1~1.3	21	5	37	5	53	5
6	-28	22	5	38	0	54	0.5~0.7
7	-28	23	0	39	0	55	5
8	-28	24	0	40	5	56	-1.2~1.3
9	-28	25	5	41	0	57	0
10	-28	26	5	42	0	58	-26
11	-28	27	5	43	0	59	-1.6
12	-28	28	0	44	0	60	0
13	-28	29	0	45	0	61	-0.9
14	-28	30	5	46	0	62	0
15	-28	31	5	47	0	63	0
16	5	32	5	48	2.3	64	0

7. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10¹ → 561 RD1/4PS 561J

47k Ω → 47 × 10³ → 473 RD1/4PS 473J

0.5 Ω → 0R5 RN2H 0R5K

1 Ω → 010 RSIP 010K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 RN1/4SR 5621F

Mark	No.	Symbol & Description	Part No.
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SWITCH BOARD ASSEMBLY

SWITCH

	S PUSH SWITCH	PSH1008
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⊙ MAIN BOARD ASSEMBLY(PWZ1721)

SEMICONDUCTORS

	IC1 PRE AMP IC	CXA1081S
	IC2 SERVO CONTROLL IC	CXA1082BS
	IC3 EFM DEMODULATION IC	CXD1135QZ
	IC4 IC(RAM)	LH5116-15
	IC6 MICROCOMPUTER	PD3144A
	IC10 SYSTEM RESET IC	M51957AL
Δ	IC11 REGULATOR IC	NJM78M05FA
Δ	IC12 REGULATOR IC	NJM79M05FA
Δ	IC17, 18 OP AMP	TA8410AK
Δ	IC30, 31 IC PROTECTOR	ICP-N10
Δ	IC33-35 IC PROTECTOR	ICP-N10
	Q1 TRANSISTOR	2SA854S
	Q2 TRANSISTOR	2SC3581
	Q3 TRANSISTOR	2SA1399
	Q5 TRANSISTOR	2SC1740S
	Q6 TRANSISTOR	DTA124ES
	Q7 TRANSISTOR	2SA933S
	Q8, 9 TRANSISTOR	2SC1740S
	Q19 TRANSISTOR	DTC124ES
	Q22 TRANSISTOR	DTC124ES
	Q26, 27 TRANSISTOR	DTC124ES
	Q40, 41 TRANSISTOR	2SC1740S
Δ	D10 DIODE	11ES2
Δ	D25 BRIDGE RECTIFIER	WLO2ML-5004
	D30-32 DIODE	1SS254

CAPACITORS

	C1 MYLOR FILM CAPACITOR	CQMA472J50
	C2 AXIAL CERAMIC CAPACITOR	CCPUSL300J50
	C3 CERAMIC CAPACITOR	CCCCH390J50
	C4 AXIAL CERAMIC CAPACITOR	CCPUSL300J50
	C5 ELECTR. CAPACITOR	CEAS471M6R3

Mark	No.	Symbol & Description	Part No.
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	C7 ELECTR. CAPACITOR	CEAS330M16
	C10 ELECTR. CAPACITOR	CEAS101M10
	C11 MYLOR FILM CAPACITOR	CQMA333K50
	C12 ELECTR. CAPACITOR	CEAS330M16
	C13 MYLOR FILM CAPACITOR	CQMA332J50

	C14 MYLOR FILM CAPACITOR	CQMA103K50
	C15 ELECTR. CAPACITOR	CEAS330M16
	C16 ELECTR. CAPACITOR	CEASR47M50
	C17 MYLOR FILM CAPACITOR	CQMA103K50
	C18 ELECTR. CAPACITOR	CEAS330M16

	C19 ELECTROLYTIC CAPACIT	CEAS102M6R3
	C20 ELECTR. CAPACITOR	CEAS330M16
	C21 MYLOR FILM CAPACITOR	CQMA333K50
	C22 ELECTR. CAPACITOR	CEASR47M50
	C23 ELECTR. CAPACITOR	CEAS330M16

	C26 ELECTR. CAPACITOR	CEAS330M16
	C27 MYLOR FILM CAPACITOR	CQMA472J50
	C28 MYLOR FILM CAPACITOR	CQMA333K50
	C29 MYLOR FILM CAPACITOR	CQMA272J50
	C30 MYLOR FILM CAPACITOR	CQMA102K50

	C31, 32 MYLOR FILM CAPACITOR	CQMA104K50
	C34 ELECTR. CAPACITOR	CEAS47M50
	C35 MYLOR FILM CAPACITOR	CQMA104K50
	C36 ELECTR. CAPACITOR	CEAS330M16
	C37 MYLOR FILM CAPACITOR	CQMA333K50

	C38 ELECTR. CAPACITOR	CEAS330M16
	C39 MYLOR FILM CAPACITOR	CQMA104K50
	C40 ELECTROLYTIC CAPACIT	CEANP47M25
	C41 ELECTR. CAPACITOR	CEAS330M16
	C43 ELECTR. CAPACITOR	CEAS101M10

	C46 MYLOR FILM CAPACITOR	CQMA103K50
	C47 MYLOR FILM CAPACITOR	CQMA472J50
	C48 ELECTR. CAPACITOR	CEAS330M16
	C50 ELECTR. CAPACITOR	CEAS330M16
	C51 MYLOR FILM CAPACITOR	CQMA102J50

	C52-54 ELECTR. CAPACITOR	CEAS330M16
	C56, 57 ELECTR. CAPACITOR	CEAS330M16
	C81, 82 CERAMIC CAPACITOR	CCCCH18J50

Mark	No.	Symbol & Description	Part No.
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	C85	ELECTR. CAPACITOR	CEASR33M50
	C86	CERAMIC CAPACITOR	CKCYF103Z50

	C87	CERAMIC CAPACITOR	CCCSL101J50
	C88	ELECTR. CAPACITOR	CEAS101M35
	C97	ELECTR. CAPACITOR	CEAS330M16
	C100, 101	ELECTR. CAPACITOR	CEAS222M16
	C102, 103	ELECTR. CAPACITOR	CEAS102M10

	C118	ELECTROLYTIC CAPACIT	CEAS220M35
	C119	CERAMIC CAPACITOR	CCCCCH390J50
	C126	ELECTR. CAPACITOR	CEAS221M16
	C128	CERAMIC CAPACITOR	CKCYF103Z50
	C133	CERAMIC CAPACITOR	CKCYF473Z50

	C134	CERAMIC CAPACITOR	CKCYF103Z50
	C161	CERAMIC CAPACITOR	CCCSL221J50
	C167	CERAMIC CAPACITOR	CKCYF473Z50

RESISTORS

	R1, 2	CARBONFILM RESISTOR	RD1/6PM□□□J
	R4	CARBONFILM RESISTOR	RD1/6PM□□□J
	R6-29	CARBONFILM RESISTOR	RD1/6PM□□□J
	R30	METAL FILM RESISTOR	RN1/6PQ3601F
	R31-36	CARBONFILM RESISTOR	RD1/6PM□□□J

	R38	CARBONFILM RESISTOR	RD1/6PM□□□J
	R40-51	CARBONFILM RESISTOR	RD1/6PM□□□J
	R53-60	CARBONFILM RESISTOR	RD1/6PM□□□J
	R62-66	CARBONFILM RESISTOR	RD1/6PM□□□J
	R68	CARBONFILM RESISTOR	RD1/6PM□□□J

	R74	CARBONFILM RESISTOR	RD1/6PM□□□J
	R76	CARBONFILM RESISTOR	RD1/6PM□□□J
	R111-113	CARBONFILM RESISTOR	RD1/6PM□□□J
	R119	CARBONFILM RESISTOR	RD1/6PM□□□J
	R121	CARBONFILM RESISTOR	RD1/6PM□□□J

	R123	CARBONFILM RESISTOR	RD1/6PM□□□J
	R126	CARBONFILM RESISTOR	RD1/6PM□□□J
	R133	CARBONFILM RESISTOR	RD1/6PM□□□J
	R143	CARBONFILM RESISTOR	RD1/6PM□□□J
	R146-149	CARBONFILM RESISTOR	RD1/6PM□□□J

	R152-155	CARBONFILM RESISTOR	RD1/6PM□□□J
	R159	CARBONFILM RESISTOR	RD1/6PM□□□J
	R161-166	CARBONFILM RESISTOR	RD1/6PM□□□J
	R168	CARBONFILM RESISTOR	RD1/6PM□□□J
	R173, 174	CARBONFILM RESISTOR	RD1/6PM□□□J

	R181	CARBONFILM RESISTOR	RD1/6PM□□□J
	R184, 185	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR2	SEMI-FIXED RESISTOR	VRTB6VS103
	VR3-7	VR	VRTB6VS223
	VR8	VR	VRTS6VS102

COIL

	L110		LAV010K
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OTHERS

	CN11	CONNECTOR	5597-17APB
	CN12	4P JUMPER CONNECTOR	KPE4
	CN301	7P JUMPER CONNECTOR	KPC7
	JA3		TOTX172
	X1	CERAMIC RESONATOR	VSS1014

Mark	No.	Symbol & Description	Part No.
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	X2	XTAL RES (OSC)	PSS1001
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⊙CONTROL BOARD ASSEMBLY (PWZ1723)**SEMICONDUCTORS**

	D201-208	DIODE	1S2473
	D209-212		SEL4214S

SWITCH

	S201-229	SWITCH	PSG1003
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RESISTORS

	R203-206	CARBON FILM RESISTER	RD1/4PM□□□J
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OTHERS

	V201	FL INDICATOR TUBE	PEL1033
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TRANSFORMER BOARD ASSEMBLY**SWITCH**

△	S301	SWITCH	PSA-009
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CAPACITORS

△	C301	CAPACITOR (CERAMIC)	RCG-009
	C314	CERAMIC CAPACITOR	CKPYX103N25
	C316, 317	CERAMIC CAPACITOR	CKPYX103N25

8. ADJUSTMENTS

The adjustment items for this unit are shown below. Adjustments must be made in the order in which they are listed. As OPEN/CLOSE operation for disc tray 2 cannot be performed during test mode, use tray 1 for adjustments.

• Adjustment and check items

1. Tracking offset, focus offset and RF offset adjustments
2. RF level adjustment
3. LD (Laser Diode) power check
4. Focus lock and spindle lock check
5. Grating adjustment
6. Tracking adjustment
7. Tangential adjustment
8. Focus gain adjustment
9. Tracking gain adjustment
10. VCO free-run frequency adjustment
11. Confirmation of S character (focus error)

• Measuring Equipment

1. Dual trace oscilloscope
2. Laser power meter
3. Test disc (YEDS-7) and an 8cm disc
4. Loop gain adjustment filter
5. Signal generator
6. Frequency counter
7. Other general tools

• Test Mode

Test mode setting and cancellation procedures

- (1) To set the test mode, turn ON the power switch (S301) while short circuit the J1 and J2 jumpers.
- (2) The test mode is cancelled by turning the power switch OFF.

The functions of the keys in the test mode are outlined in Table -1.

• Adjustment VRs (Variable Resistors) and Names

- VR1: Laser power
 VR2: RF offset (RF. OFS)
 VR3: Focus gain (FCS. GAN)
 VR4: Tracking gain (TRK. GAN)
 VR5: Tracking balance (TRK. BAL)
 VR6: Focus offset (FCS.OFS)
 VR7: Tracking offset (TRK. OFS)
 VR8: VCO free-run adjustment (VCO. ADJ)

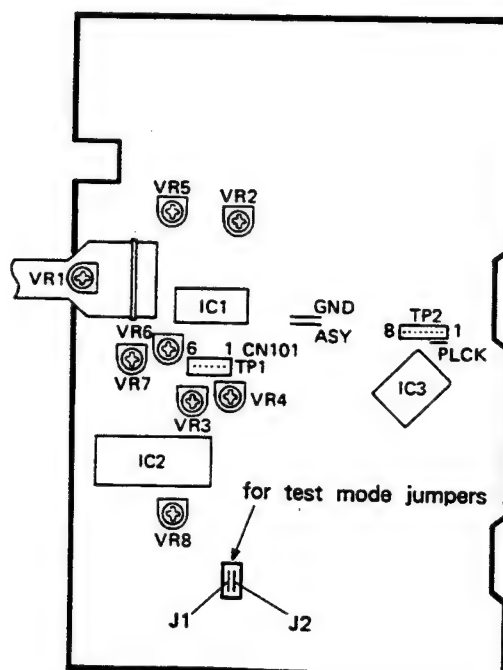
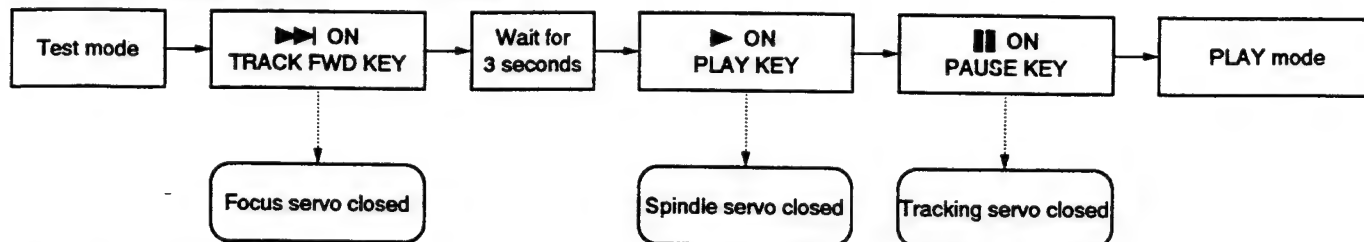


Fig. -1 Adjustment points

In the test mode, the servos are closed and opened individually. Consequently, the servos must each be closed one at a time (in serial sequence) in order to set the unit to normal PLAY mode. Note also that during test mode the unit will not enter the PLAY mode when the PAUSE (■) key is pressed alone.

* In the test mode, the servos must be operated in serial sequence.

Example: Switching from STOP to PLAY mode.



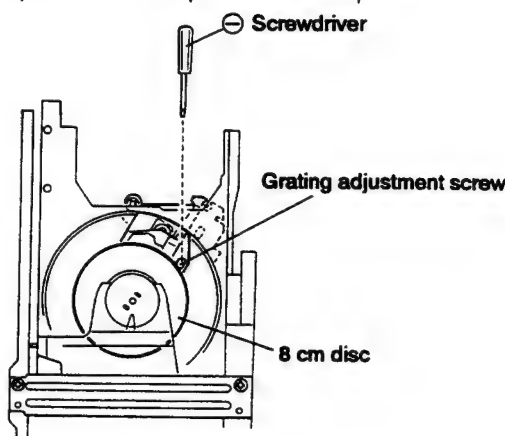
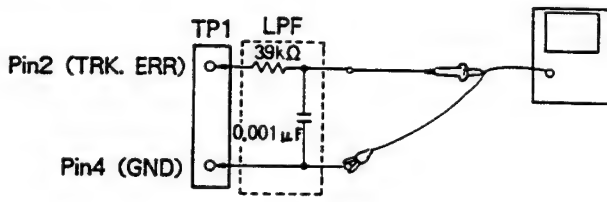
• Key Functions in the Test Mode

Symbol	Key name	Function during test mode	Description
▶▶	TRACK FWD	Focus servo close	Turns ON the laser diode, and raises/lowers the focusing actuator to close the focus servo. After closing disc tray 1, the tray is moved to PLAY position.
▶	PLAY	Spindle servo close	Closes the servo in the CLV-A mode after starting the spindle motor.
■	PAUSE	Tracking servo close/open	Performs toggle operation: closes the tracking servo and sets to PLAY mode when pressed (provided the focus and spindle servos are closed), at which time the PAUSE indicator illuminates; opens the tracking servo when pressed again.
◀◀	MANUAL SEARCH REV	Carriage reversal (inward movement)	Moves carriage rapidly (3 cm/s) toward the center. Because there is no safety mechanism for stopping the carriage, release the key when the carriage reaches the innermost track.
▶▶	MANUAL SEARCH FWD	Carriage advance (outward movement)	Moves carriage rapidly (3 cm/s) toward the outer edge. Because there is no safety mechanism for stopping the carriage, release the key when the carriage reaches the outermost track.
■	STOP	Stop	Stops all servos and returns system to its initial state.
▲	OPEN/CLOSE Disc I	(Disc tray) open/close	Opens and closes the disc tray. However, pickup does not return to rest when opening, and remains stationary when closing the tray.

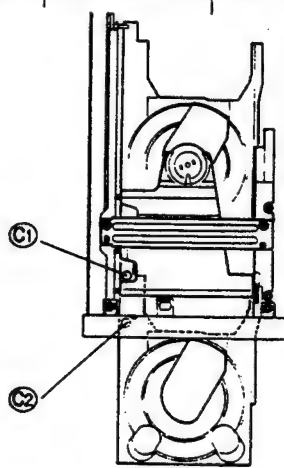
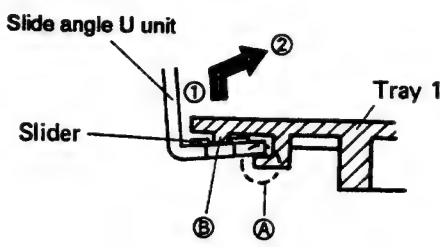
Table -1.

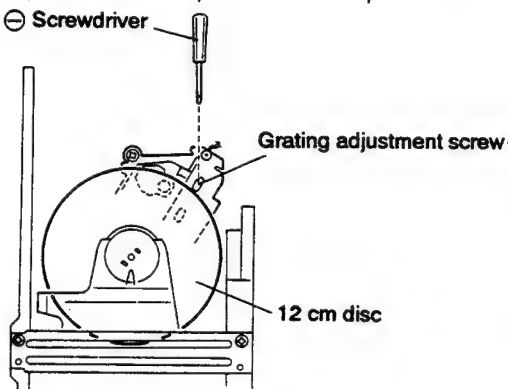
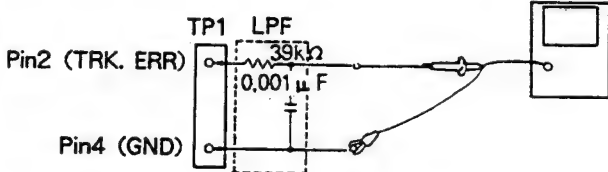
Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
1	TRACKING OFFSET, FOCUS OFFSET, RF OFFSET ADJUSTMENT					
			TP1 Pin 2 (TRK. ERR)	VR5 (TRK. BAL) VR7 (TRK. OFS)	Tracking offset 45° 0V ± 50 mV	<ul style="list-style-type: none">• Set to test mode (※).• Turn VR5 TRK. BAL (tracking balance) counterclockwise about 45° from center position.• Adjust VR7 TRK.OFS (tracking offset) so that the TRK. ERR (tracking error) voltage at TP1 Pin 2 becomes 0V ± 50 mV.• Adjust VR6 FCS.OFS (focus offset) so that the FCS.ERR (focus error) voltage at TP1 Pin 6 becomes 0V ± 50 mV.• Adjust VR2 RF.OFS (RF offset) so that the RF output voltage at TP1 Pin 1 becomes 100 mV ± 50 mV. <p>Note: After performing tracking offset adjustment, be sure to perform "6. TRACKING BALANCE ADJUSTMENT."</p>
			TP1 Pin 6 (FCS. ERR)	VR6 (FCS. OFS)	Focus offset 0V ± 50 mV	
			TP1 Pin 1 (RF output)	VR2 (RF. OFS)	RF offset 100 mV ± 50 mV	
2	RF LEVEL ADJUSTMENT					
			TP1 Pin 1 (RF output)	VR1 (laser power)	1.5V +0.2V -0V.	<ul style="list-style-type: none">• Set to test mode (※).• Play the test disc, connect the oscilloscope to TP1 Pin 1 (RF output), and measure the P-P voltage of the RF waveform.• Adjust so that the voltage becomes 1.5V +0.2V -0V.
3	LD (LASER DIODE) POWER CHECK					
					Less than 0.13 mW	<ul style="list-style-type: none">• Set to test mode (※).• Press the TRACK FWD (▶▶) key to turn ON the LD (laser diode).• Place the sensor of the laser power meter directly above the objective lens and confirm that the output power of the LD does not exceed 0.13 mW.

※ : See page 27.

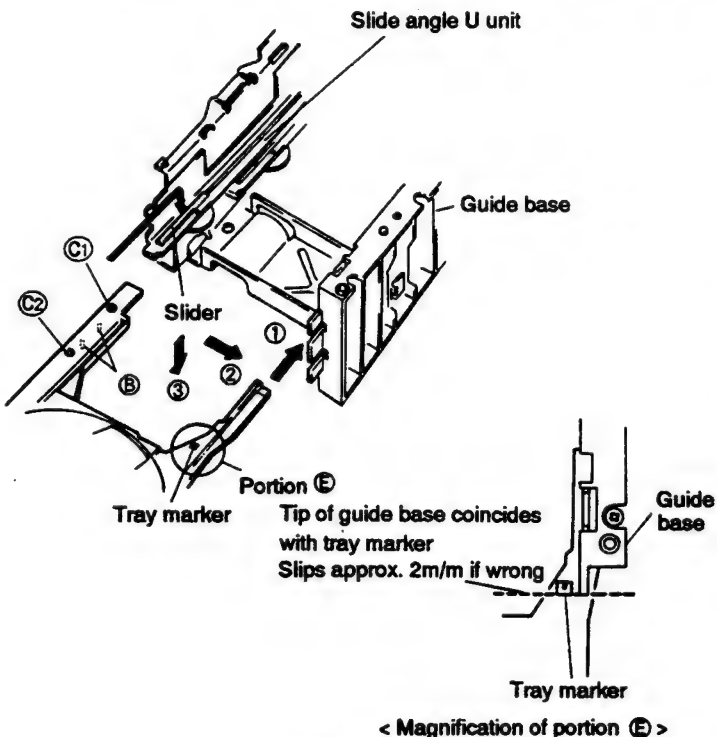
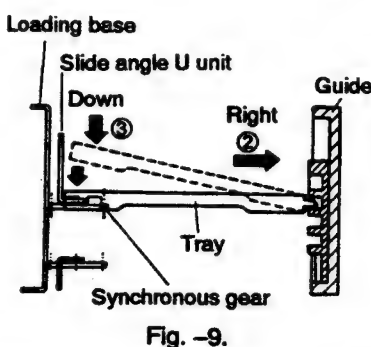
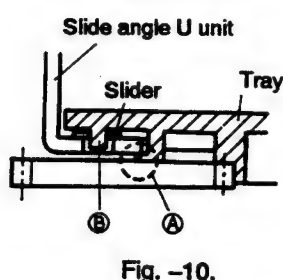
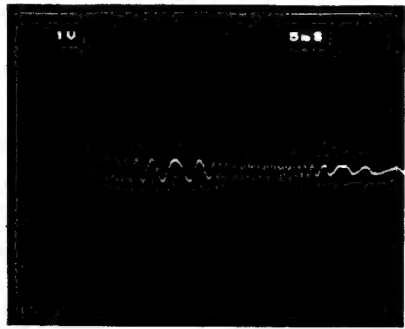
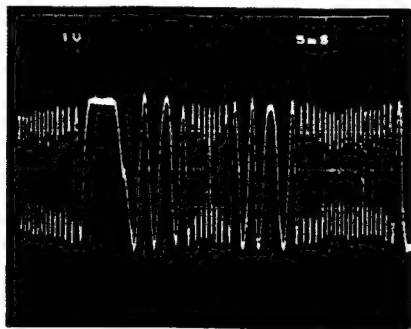
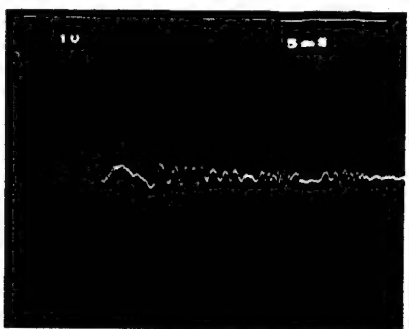
Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
4	FOCUS LOCK AND SPINDLE LOCK CHECK					
	V 0.5V/div	H 100 msec /div	TP1 Pin 1 (RF output)	RF output exists Normal (clockwise) rotation	<ul style="list-style-type: none">Set test disc.Set to test mode (※).Press the MANUAL SEARCH FWD (▶▶) key to move the pickup close to the center of the disc.Observe the output of TP1 Pin 1 (RF output) on the oscilloscope. Confirm that the RF signal is output after pressing the TRACK FWD (▶▶) key.Press the PLAY (▶) key and confirm that the disc rotates at constant speed (approx. 300 rpm near center of disc) in the normal (clockwise) direction; make sure that the disc does not rotate too fast or counter-clockwise.	
5	GRATING ADJUSTMENT (1) (using an 8 cm disc)					
					<p>Note: This adjustment can only be performed using an 8 cm disc having pits over a diameter of 75 mm.</p> <ul style="list-style-type: none">Set to test mode (※).Set the 8 cm disc. Shift the pickup to the outermost track so that it is positioned over pits and the pickup grating adjustment hole is visible from the hole in the servo mechanism (see Fig. -2.).Press the TRACK FWD (▶▶) and PLAY (▶) keys in sequence to close the focus servo and spindle servo (do not close the tracking servo).Observe the waveform output of TP1 Pin 2 TRK.ERR (tracking error) on the oscilloscope, inserting a 4 kHz low-pass filter (see Fig. -3.).	
					<p>Fig. -3.</p>	

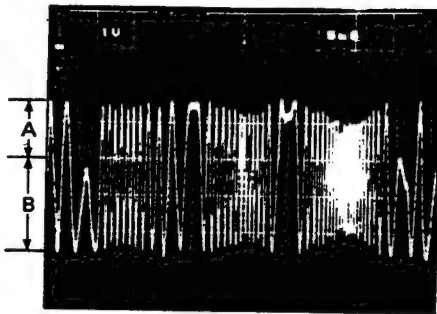
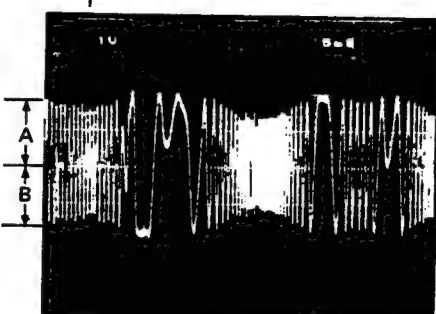
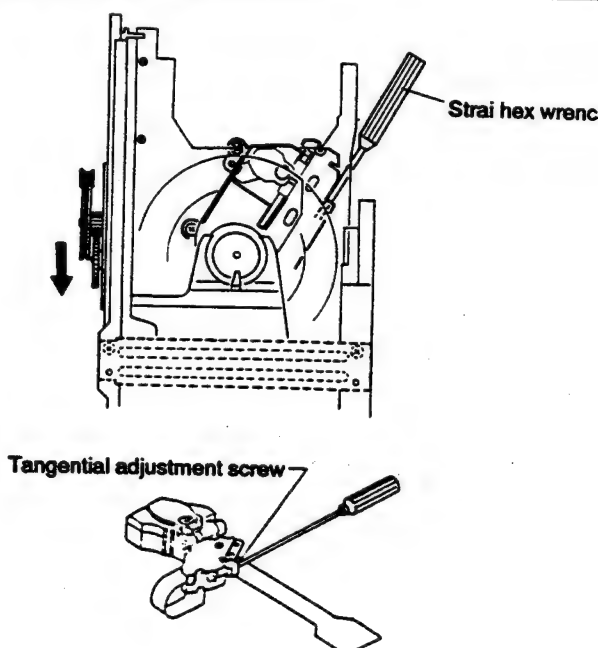
※ : See page 27.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK. ERR)	Grating Grating	Null Point Maximum amplitude	<ul style="list-style-type: none"> Insert \ominus screwdriver into the grating adjustment hole, and turn to find the null point (see Photo -1.). Next, slowly turn \ominus screwdriver in counterclockwise direction from the null point and adjust until the waveform (tracking error signal) reaches maximum amplitude (see Photo -2.). <p>Note: Use caution since inserting \ominus screwdriver forcefully will cause the pickup unit to float upward.</p> <ul style="list-style-type: none"> Finally, confirm that there is no major fluctuation in the P-P voltage of the tracking error signal (do not insert the cutoff 4 kHz low-pass filter) when the pickup is shifted to the innermost track and when the pickup is shifted to the outermost track. If there is a difference of more than $\pm 10\%$, re-adjust by turning the grating adjustment screw to the maximum amplitude point of the tracking error signal.
5 GRATING ADJUSTMENT (2) (without 8 cm disc)						
	 <p>Fig. -4.</p>  <p>Fig. -5.</p>					<p>Perform this adjustment when an 8 cm disc is not available and Grating adjustment (1) cannot be performed.</p> <p>Remove the tray 1 before performing this adjustment.</p> <ul style="list-style-type: none"> Removal of tray 1 <ol style="list-style-type: none"> Set tray 1 to OPEN position. Remove screws $\textcircled{C1}$, $\textcircled{C2}$ holding tray 1 in Fig. -4. Move tray 1 in the direction of arrow in Fig. -5, and as detaching projection \textcircled{B} of tray 1, free slide angle U unit from hook \textcircled{A} of tray 1. Pull out tray 1 as raising its side of slide angle U unit slightly.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
			<div><p>Fig. -6.</p></div>			
			<div><p>Fig. -7.</p></div>			
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK. ERR)	Grating Grating	Null Point Maximum amplitude	<p>Note: This adjustment can only be performed using a disc having pits up to a diameter 115 mm. The test disc (YEDS-7) cannot be used.</p> <ul style="list-style-type: none">Set to test mode (※).Set a disc. Shift the pickup to the outermost track so that it is positioned over pits and the pickup grating adjustment hole is visible from the hole in the servo mechanism (see Fig. -8.).Press the TRACK FWD (▶▶) and PLAY (▶) keys in sequence to close the focus servo and spindle servo (do not close the tracking servo).Observe the waveform output of TP1 Pin 2 TRK. ERR (tracking error) on the oscilloscope, inserting a 4 kHz low-pass filter (see Fig. -7.). <ul style="list-style-type: none">Insert ⊖ screwdriver into the grating adjustment hole, and turn to find the null point (see Photo -1.).Next, slowly turn ⊖ screwdriver in counterclockwise direction from the null point and adjust until the waveform (tracking error signal) reaches maximum amplitude (see Photo -2.). <p>Note: Use caution since inserting ⊖ screwdriver forcefully will cause the pickup unit to float upward.</p> <ul style="list-style-type: none">Finally, confirm that there is no major fluctuation in the P-P voltage of the tracking error signal (do not insert the cutoff 4 kHz low-pass filter) when the pickup is shifted to the innermost track and when the pickup is shifted to the outermost track. If there is a difference of more than ± 10%, re-adjust by turning the grating adjustment screw to the maximum amplitude point of the tracking error signal.

※ : See page 27.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
	<div><p>Slide angle U unit</p><p>Guide base</p><p>Slider</p><p>Tray marker</p><p>Portion E</p><p>Tip of guide base coincides with tray marker</p><p>Slips approx. 2m/m if wrong</p><p>Tray marker</p><p>< Magnification of portion E ></p></div> <p>Fig. -8.</p> <div><p>Loading base</p><p>Slide angle U unit</p><p>Down</p><p>Right</p><p>Guide</p><p>Tray</p><p>Synchronous gear</p></div> <p>Fig. -9.</p> <div><p>Slide angle U unit</p><p>Slider</p><p>Tray</p><p>B</p><p>A</p></div> <p>Fig. -10.</p>					<p>After completing adjustments, attach tray 1 in the following process.</p> <p>Remove front panel previously as it disturbs attachment of tray 1.</p> <ol style="list-style-type: none">1. Set slide angle U unit to the foremost position (where opening of tray 1 is completed).2. Set slider to the foremost position as shown in Fig. -8.3. As shown by dotted line in Fig. -9, insert tray 1 aslant to the position that mounting holes of slider and tray 1 coincide (make sure that slider does not move backward).4. Down tray 1 as pulling it to the right (toward guide). Do it as holding slider from below with finger.5. Adjust position of tray 1 so that hook (A) and projection (B) are properly fixed as shown in Fig. -10. Also do it so that to engage synchronous gear with gear of tray 1.6. Make sure that mounting holes of slider are being positioned in the center of tray 1's screw holes, and tighten screws in order of (C1, C2).7. After completing attachment of tray 1, with tray 1's complete-open state, make sure that mutual position shown in the portion E's enlarged illustration is being satisfied. If it does not, the adjustment must be made again from the beginning.
	<div><p>Photo-1 Null point</p><p>Photo-2 Maximum amplitude</p><p>Photo-3 This is not the null-point waveform</p></div>					

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
6	TRACKING BALANCE ADJUSTMENT					
	0.5V/div	5 msec/div	TP1 Pin 2 (TRK. ERR)	VR5 (TRK. BAL)		<ul style="list-style-type: none">• Set the test disc.• Set to test mode (※).• Press the MANUAL SEARCH FWD (▶▶) key to position the carriage near the center of the disc.• Press the TRACK FWD (▶▶) key and then the PLAY (▶) key to cause the disc to rotate.• Observe the waveform output by TP1 Pin 2 TRK.ERR (tracking error) on the oscilloscope and adjust VR5 TRK. BAL (tracking balance) so that the DC component disappears from the tracking error signal.
<div><div><p>Photo-4 DC elements mixed in signal</p></div><div>→</div><div><p>Photo-5 DC elements eliminated</p></div></div>						
7	TANGENTIAL ADJUSTMENT					
	 <p>Fig. -11.</p>					<ul style="list-style-type: none">• Set to test mode (※).• Open tray 1 and set the disc.• Close tray 1.• Press the MANUAL SEARCH FWD (▶▶) key to position the pickup at the outermost track.• Rotate gear-pulley by hand in the direction indicated by the arrow and move tray 2 up so that the tangential adjustment screw section becomes visible.• Insert a hexagonal wrench into the tangential adjustment screw section from the right-aslant in the rear of mechanism.• Press the MANUAL SEARCH REV (◀◀) key to position the pickup somewhere at the middle of the tracks.• Press the TRACK FWD (▶▶) key, PLAY (▶) key, and PAUSE (⏏) key in that order to close all the servos (the pause indicator will illuminate).

※ : See page 27.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
		200 ns/div	TP1 Pin 1 (RF output)	Tangential adjustment screw	Sharpest possible eye pattern	<ul style="list-style-type: none"> Observe the waveform output by TP1 Pin 1 (RF output) on the oscilloscope and adjust the tangential adjustment screw to achieve the sharpest possible eye pattern. The correct adjustment point is halfway between the two points where the eye pattern becomes blurred when rotating the tangential adjustment screw clockwise and then counterclockwise. When the whole waveform becomes clear, concentrate on sharpening the fine lines forming the diamond shape at the center of the eye pattern (see Photo -7.). Adjust until the diamond shape consists of single thin lines.

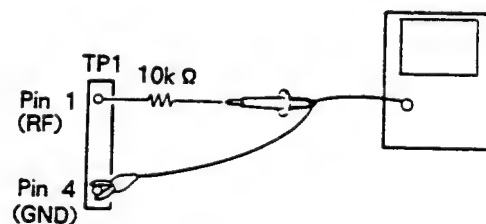


Fig. -12.

Note: Use a hexagonal wrench to keep the pickup in raised position while performing this adjustment.

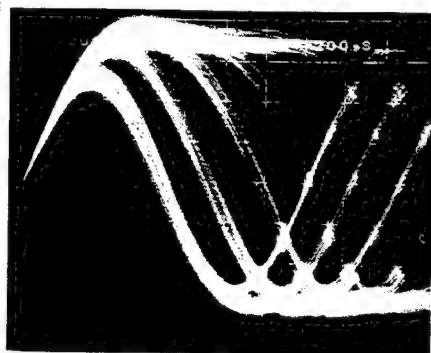


Photo-6

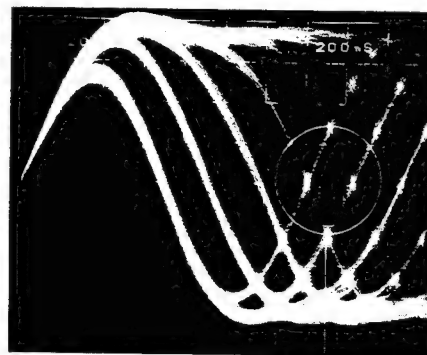


Photo-7

Part to be observed

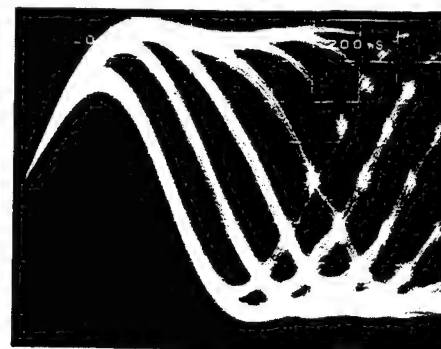
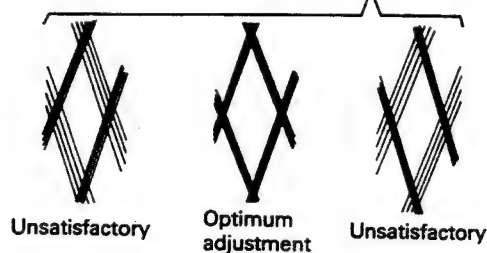


Photo-8



Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				

8 FOCUS GAIN ADJUSTMENT

CH1 (X) , CH2 (Y)
20 mV/div, 5 mV/div
(probe: 10:1)

X-axis
TP1 Pin 5
(FCS. IN)

Y-axis
TP1 Pin 6
(FCS. ERR)

VR3
(FCS. GAN)

Phase difference
of 90°

- With the oscillator power turned OFF, connect the oscilloscope and oscillator as shown in Fig. -13.
 - Set to normal PLAY mode.
 - Turn ON the power of the oscillator and set it to output a 1.2 kHz 1 Vp-p signal.
- Note: Some oscillators discharge a DC voltage when power is turned on. In that case it is recommended to connect the oscillator after it has been turned on.
- Adjust VR3 FCS.GAN (focus gain) so that the Lissajous figures form a horizontal circle on the oscilloscope (phase difference of 90°).

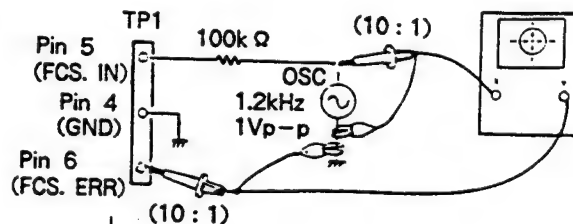
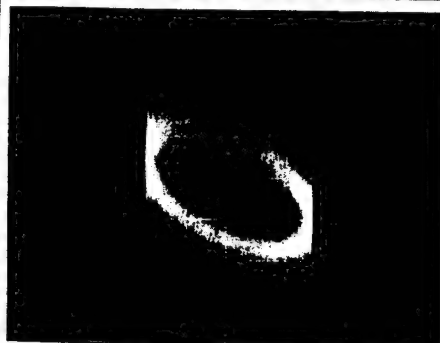
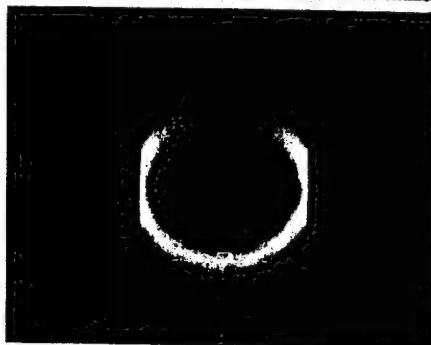


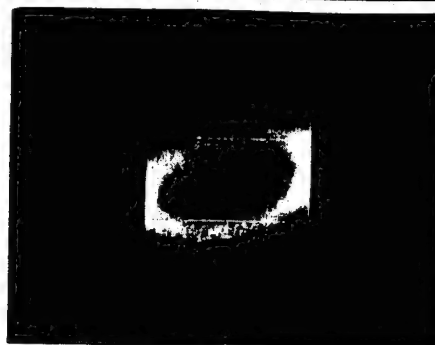
Fig. -13.



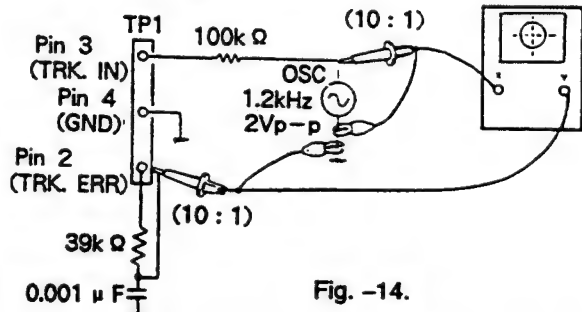
Gain overcompensated
Photo-9




Gain optimum
Photo-10




Gain undercompensated
Photo-11


Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
9	TRACKING GAIN ADJUSTMENT					
	CH1 (X) , CH2 (Y) 50 mV/div, 5 mV/div (probe: 10:1)	X-axis TP1 Pin 3 (TRK. IN) Y-axis TP1 Pin 2 (TRK. OUT)	VR4 (TRK. GAN)	Phase difference of 90°	<ul style="list-style-type: none">• With the oscillator power turned OFF, connect the oscilloscope and oscillator as shown in Fig. -14.• Set to normal PLAY mode.• Turn ON the power of the oscillator and set it to output a 1.2 kHz 2 Vp-p signal. <p>Note: Some oscillators discharge a DC voltage when power is turned on. In that case it is recommended to connect the oscillator after it has been turned on.</p> <ul style="list-style-type: none">• Adjust VR4 TRK. GAN (tracking gain) so that the Lissajous figures form a horizontal circle on the oscilloscope (phase difference of 90°).	 <p style="text-align: right;">Fig. -14.</p>



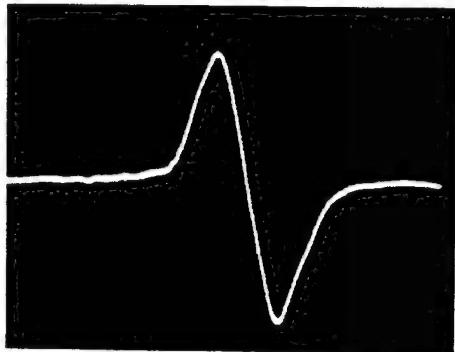
Gain overcompensated
Photo-12



Gain optimum
Photo-13

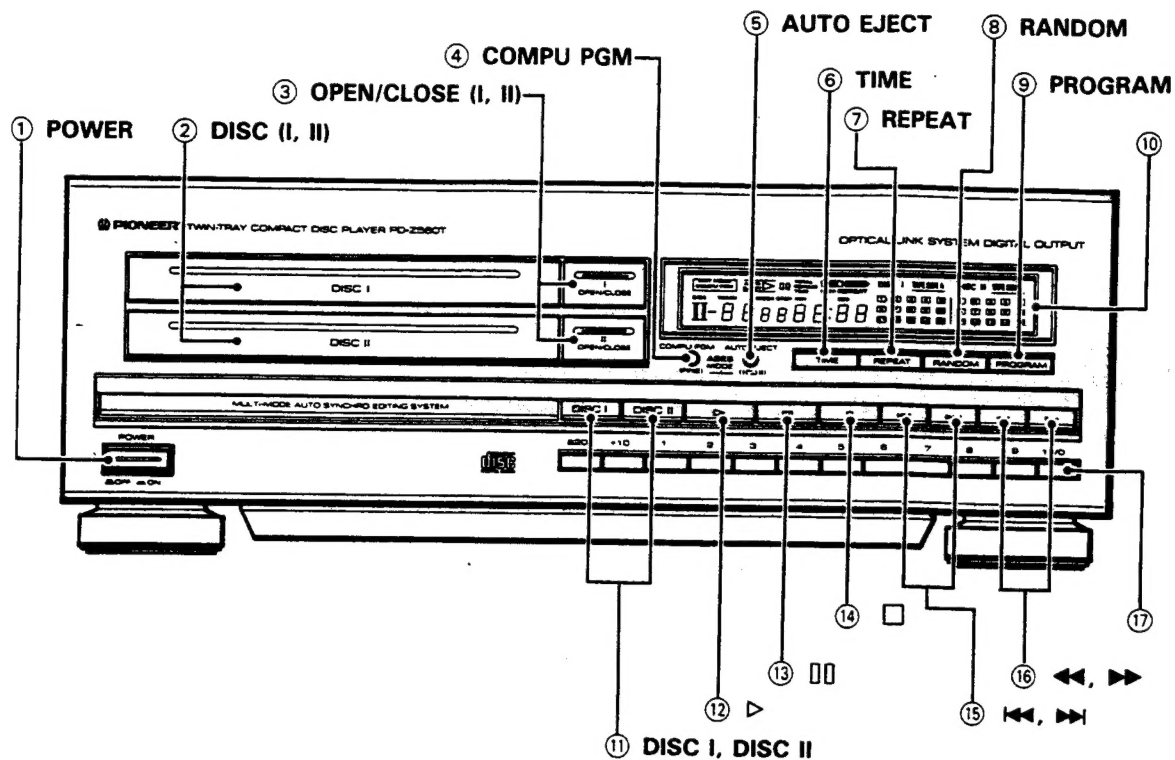


Gain undercompensated
Photo-14

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check Items/ Adjustment Specifications	Adjustment Procedure
	V	H				
10	VCO FREE-RUN FREQUENCY ADJUSTMENT					
			TP2 Pin 2 (PLCK)	VR8 (VCO. ADJ)	4.275 ± 0.025 MHz	<ul style="list-style-type: none">• Set to test mode (※).• Short-circuit the ASY and GND jumpers with ⊖ screwdriver or similar tool (see Fig. -1.).• Connect a frequency counter capable of measuring frequencies of 10 MHz and above to the PLCK jumper.• Adjust VR8 VCO. ADJ (VCO free-run adjustment) so that the frequency counter reading becomes 4.275 ± 0.025 MHz.
11	CONFIRMATION OF S CHARACTER (FOCUS ERROR)					
			TP1 Pin 6 (FCS. ERR)			<ul style="list-style-type: none">• Set to test mode (※).• Short-circuit TP1 Pin 5 FCS. IN (focus in) and Pin 4 GND.• Observe the waveform output by TP1 Pin 6 FCS. ERR (focus error) when pressing the TRACK FWD (▶▶) key.
						
	Focus error Photo-15					

※ : See page 27.

10. PANEL FACILITIES



① POWER switch

Press to turn power to the unit ON and OFF.

② DISC (I, II)

These are where the discs are set. When power is switched ON and OPEN/CLOSE key ③ is pressed, the tray is ejected forward.

To insert the tray, press OPEN/CLOSE key ③, or lightly push the tray in with your finger.

③ OPEN/CLOSE keys (I, II)

Press when you wish to eject or load a disc. Each time the key is pressed, the tray is alternately pushed out or pulled in.

④ COMPU PGM key

This key is used for COMPU PGM editing.

⑤ AUTO EJECT key

Press to perform auto eject playback.

When a disc is finished playing, the disc's disc tray will automatically eject. The other disc tray will close and playback will start. By replacing discs, continuous playback can be maintained.

⑥ TIME key

This key selects the display mode of the indicator panel. Each time the key is pressed, the indication changes from TIME, REMAIN, to TOTAL in that order. (For details concerning the display contents, refer to the explanation about the indicators.)

⑦ REPEAT key

Press this key for repeat playback. Pressing the key once, twice, or three times will change the repeat mode from single track repeat, all tracks repeat, and repeat playback cancellation.

⑧ RANDOM key

Press to begin random playback.

⑨ PROGRAM key

Use to program a sequence of tracks.

- Press this key to set the unit to program mode. Then specify the desired DISC and TRACK.

The DISC and TRACK will be programmed as they are entered in this way.

⑩ Indicators

COMPU PGM : Displays when COMPU PGM editing is set or used.

AUTO EJECT : Lights during auto eject playback.

▷ : Lights during playback.

⏏ : Lights during temporarily interrupted playback.

TIME/REMAIN/TOTAL

: Changes each time TIME key ⑥ is pressed.

- TIME : Displays the track number of the track being played (TRACK) and the elapsed time (minutes and seconds).

9. FOR HB TYPE

CONTRAST OF MISCELLANEOUS PARTS

NOTES :

- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The PD-Z560T/HB type is the same as the PD-Z560T/HEM type with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PD-Z560T /HEM type	PD-Z560T /HB type	
Δ	AC Power cord	PDG1008	PDG1021	
	Operating instructions (English, French, German, Italian, Dutch, Spanish, Portuguese, Swedish)	PRE1103	.....
	Operating instructions (English)	.....	PRB1112	

- **REMAIN** : Displays the remaining time on the track being played.
When the TIME key ⑥ is pressed again, the remaining time on the disc being played will be displayed.
- **TOTAL** : Displays the total number of tracks on the disc (TRACK) and the overall playback time (minutes and seconds) of disc I.
When TIME key ⑥ is pressed again, the total number of tracks on the disc (TRACK) and the overall playback time of disc II will be displayed.
During playback, the display goes on for about 5 seconds before changing to the TIME display.
- RND** : Lights during random playback.
- PGM** : Lights during program mode.
- (1)▶REPEAT** : Lights during repeat playback of one track.
- REPEAT** : Lights during repeat play.
- DISC I/TAPE SIDE A (Music calendar)** : Only the numbers of the tracks recorded on DISC I will light. When inputting a program and when playing, only the programmed track numbers will light.
The track numbers will go out one by one as the tracks are played.
After editing, the track numbers that can be recorded on the A side of the tape will light.
- DISC II/TAPE SIDE B (Music calendar)** : Only the numbers of the tracks recorded on DISC II will light. When inputting a program and when playing, only the programmed track numbers will light.
The track numbers will go out one by one as the tracks are played.
After editing, the track numbers that can be recorded on the B side of the tape will light.
- DISC** : Displays the disc number (I or II) of the disc to be played.
- TRACK** : Displays the current track number (during normal playback and programmed playback) or the track being programmed during the programming operation.
- INDEX** : Displays the index number of the music section of a track or the track division.
- STEP** : Displays the program steps.
- MIN (minute)** : Displays the minutes of the elapsed time, total playback time, and remaining time.
- SEC (second)** : Displays the seconds of the elapsed time.

⑪ DISC select keys (DISC I, DISC II)

- DISC I : Use to select DISC I for playback or programming.
- DISC II : Use to select DISC II for playback or programming.

⑫ Play key (▶)

Press to begin playback, and to cancel the pause mode.

⑬ Pause key (⏸)

Press to temporarily interrupt playback. When pressed again, the pause mode is cancelled and playback resumes.

⑭ Stop/clear key (□)

Press to stop playback. When pressed, the player goes into stop mode and all operations stop.
Press to clear a program. When pressed during stop mode, the program stored in memory is cleared.

⑮ Track search keys (◀, ▶)

During normal playback, programmed playback or pause modes, these keys are pressed to search for the desired track. Pressing either key causes the player to advance to the next track or to return to the previous track. When the player is stopped at PROGRAM mode, the performance time of each track is displayed by pressing [◀, ▶] keys.

⑯ Manual search keys (◀◀, ▶▶)

When the player is in playback or pause modes, these keys are pressed to perform fast forward or reverse operations to allow manual searching. These operations are only carried out during the time either key is pressed.

⑰ Track number keys (1 to 10/0, +10 and ≥20)

- These keys are used to specify the track numbers (tracks 1 to 99) for direct track selection or program entry.
- During COMPU PGM editing, the keys are used to specify the time period (in minutes).

11. SPECIFICATIONS

1. General

Type Compact disc digital audio system

Power requirements

European models AC 220V, 50/60Hz

U.K. models AC 240V, 50/60Hz

Power consumption 15W

Operating temperature +5°C – +35°C
(+41°F – +95°F)

Weight 4.3kg (9lb, 8oz)

External dimensions 360(W) × 325(D) × 128(H)mm
14-3/16(W) × 12-25/32(D) × 5-1/32(H) in.

2. Output terminal

Optical digital output terminal

3. Functions

- Play
- Pause
- Track search
- Manual search
- Programmed playback

- Programmed repeat
- Pause program
- Computer program edit
- Single track repeat
- Sequential disc all track repeat
- Relay playback
- Random relay play
- Program relay play
- Auto eject play
- Auto eject random play
- Auto eject program play
- Random play
- Random repeat

4. Accessories

- Optical fiber cable 1
- Operating instructions 1

NOTE:

The specifications and design of this product are subject to change without notice, due to improvements.